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THE ARTERY BANK AND ARTERIAL GRAFTS
PART I. THE ARTERY BANK *

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INTRODUCTION

Successful replacement of arterial segments of the vascular tree is dependent not only on proper selection of the patient and competency of the surgeon but also on the availability of a suitable graft. An artery bank at present is the only practical means of insuring availability of a proper graft at a given time and place. Since the vessel needed is almost always a large one, an autogenous graft is usually out of the question. It is true that under certain circumstances an antogenous venous graft may be used but its utility is restricted. An artery bank is concerned with selection of the proper material, preparation of the graft for storage, and methods of storage.

This discussion will be presented in two parts. In the first part the various managerial phases of the artery bank, together with a consideration of possible future trends in this field, will be considered. In the second part the physiology, function, indications and results of arterial grafts will be presented. For the past three years an artery bank has been maintained in the Department of Surgery of the Tulane University School of Medicine.‡ The opinions expressed in this paper are based on experiences with this bank, personal communication with some of the outstanding authorities in this field, and various contributions to the extensive literature on this subject.

COLLECTION

Although time and experience have expanded the original specifications under which grafts were collected, certain rules for their collection and storage still must be observed if subsequent mishaps are to be avoided. Obviously, careful records must be kept of deposits and withdrawals in this as in other banks. At the time of collection, a graft should be numbered and the date, length in centimeters, general condition of the vessels and mode of death of the donor should be recorded. A culture should be made before storage. Since frosting of the glass containers in the refrigerator may prevent accurate appraisal of a graft at the time of operation, a description of its branchings and their length is valuable.

Permission from the responsible relative to remove the graft is essential. As the laity becomes acquainted with the life saving role played by grafts, it is conceivable that like eyes, vessels will be bequeathed to banks. This source will prob-

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‡ Under the direction of Dr. P. T. DeCamp and the author. Maintenance and expansion of this bank was made possible by Grant C-393 from the Edward G. Schlieder Foundation.

ably never be as productive as in eye banks because circumstances are not at all parallel. Prospective "donors" of suitable arteries are usually young and death has often been sudden. Anticipation of death then would be doubly unexpected.

Sterile Technic—Grafts may be collected either under sterile conditions or they may be obtained during routine post-mortem examination and later sterilized by chemical means. The chief advantage of the former method of collection is that it obviates the danger of damaging the graft by use of a chemical. However, it is a cumbersome method in many ways. Sterile drapes and instruments must be brought to the morgue and the donor's skin prepared as for a surgical operation. The time limit for obtaining the graft after death should be not more than eight hours, somewhat less leeway than can be allowed in the asterile method. The body should, of course, be refrigerated until the graft is secured. This spells inconvenience for the personnel since the graft may have to be collected in the middle of the night. Also, pathologists or coroners often object to the ritual of a sterile technic in the autopsy room. Finally, in the sterile technic the body cavity from which the graft is taken must be unsoiled by perforation of a hollow viscus. This factor alone limits its possibilities since most of the donors have been victims of trauma.

Asterile technic—The ability to collect arterial grafts for storage from routine post-mortem examinations offers tremendous advantages in time and convenience, and greatly increases the number of prospective donors, since contamination of the peritoneal or thoracic cavity does not exclude collection of the aorta or other vessels.

It is difficult, however, to find a means of completely sterilizing a graft without injuring it. One solution to the problem, suggested by Meeker and Gross,[1] is use of irradiation, 2.0 to 2.5 million R. E. P. being employed. However, only a small number of medical centers in the United States have the expensive apparatus necessary to accomplish this.

Two chemicals are at present in common use for sterilizing grafts: ethylene oxide and beta propriolactone. The former, as suggested by Hufnagel, Rabil and Reed,[2] in 1953, is the chemical used for sterilization of grafts in our bank. Although it is apparently an effective sterilizing agent, its inflammability and explosiveness make it dangerous to handle. This difficulty can be overcome by sterilizing the grafts out of doors. A colorless liquid that boils at 10° C., ethylene oxide evaporates easily. It may be obtained in cylinders of various sizes containing from 8 oz. to 175 lb. of the chemical.‡‡ There is less waste by using the larger units but they may be awkward to handle. One solution is to place the drum upside down in a wooden or steel frame leaving enough clearance to place a container beneath the outlet. The liquid may then be drawn off by means of a needle valve.§ It is essential that the drum be placed out of doors and the ethylene oxide be allowed to evaporate in the open, as its explosiveness makes it dangerous in a room or a hood where sparks from a motor or switch could ignite the fumes.

The grafts are placed in sterile open containers and covered with ethylene oxide. The portion that has not evaporated in thirty minutes is decanted off and after a few minutes the container is closed with a sterile cap.

Use of beta propriolactone has been described in a report by Trafas and associates.[3] Its use requires a meticulous technic with particular attention to buffering and proper incubation. De Takats[4] observed two instances of rupture of a graft apparently due to inadequate buffering.

Fisher and coworkers[5] believed that grafts collected at autopsy can be sterilized adequately by use of large doses of antibiotics plus lyophilization. Lyophilization alone does not sterilize a graft. It is well known that viruses survive such drying, but it also, should be realized, as

‡‡ The Matheson Co., East Rutherford, N. J.

§ No. 51-510, The Matheson Co., East Rutherford, N. J.

pointed out by Stark and Harrington,[6] that common bacteria, such as streptococci and B. coli, may survive such treatment.

Time of Collection—Formerly, it was believed that arterial grafts should be obtained within six hours of death of the donor. However, it has been shown that with refrigeration of the body, although delay is not desirable, as much as eight hours may elapse between death and collection of the graft. Deterling[7] indicated that even a longer interval than this may be permissible.

Age of Donor—Originally, it was arbitrarily considered that the age of the donor should not exceed 30 years. Although the arteries of donors older than this will in all likelihood be unsuitable, occasionally pliable arteries free of sclerotic plaques are found in much older individuals. Surprisingly enough, on the other hand, unsuitable vessels may be found in those under 30 years of age. Since adoption of the asterile technic of collection, it has been our custom to base our decision solely on the physiologic rather than the chronologic age of the arteries. When the sterile technic was used, strict adherence to the age limit was necessary to avoid waste of time and effort in unlikely cases.

Infection and Malignancy — A person who has died of a transmissible disease is not a suitable donor of an arterial graft collected under sterile conditions. Even if a graft from a donor dying of infection is sterilized, there still are theoretic and esthetic considerations that make it less desirable. Viruses, for instance, are apt to behave in a bizarre way measured by standards for common bacteria. Presumably, ethylene oxide is effective against viruses but to my knowledge no experimental work has been done on this subject. In cases of chronic infection the objections are obvious. Because of ignorance concerning the nature and transmission of neoplasms, as well as for esthetic reasons, arteries from donors who had malignant disease should be rejected.

Technic of Collection—In the collection of arterial grafts, care should be taken to avoid as much fat and other extraneous tissue as possible. Large branches should be left as long as possible so that they may be used for bifurcation or branched grafts and so that the shorter ones, such as the intercostal or lumbar arteries, may be ligated at the time of operation. If the branch is cut flush with the parent vessel, the defects in the graft must be sewed in order to avoid leakage, a procedure involving considerably more time and trouble than ligation. It is best to postpone ligation and suturing of the branches until just before using, as shrinkage of tissues incident to lowering of temperatures during storage may cause loosening of the ligatures or suture line.

Final stripping and cleaning of adventitia should also be done at the time of application of the graft. Before sterilization with chemicals, however, gross amounts of adipose and perivascular tissue should be discarded.

STORAGE

Quick Frozen Method — Grafts may be stored in one of two ways. They may be quick frozen and placed in a carbon dioxide ice box, or they may be prepared by freeze-drying and kept in vacuum sealed tubes at room temperature. The former method requires less technical knowledge, and is simpler and cheaper. However, the length of time that grafts prepared in this way can be safely kept is limited. The exact limits of safety are not known. In the beginning we discarded grafts stored in this manner after six weeks. However, during the past year we have extended the duration of storage of such grafts to six months with no apparent deleterious effects. To avoid rupture of tissues by slow crystallization it is probably best to freeze the graft as quickly as possible after collection or to freeze-dry it by immersion of its container in a mixture of absolute alcohol and dry ice. This mixture provides a temperature of —78° C.

The carbon dioxide ice box is similar to an ordinary ice chest (Fig. 1). An extra thickness of insulation is desirable. The one we had built measures 30.5 by 26 by 22 inches. A slightly deeper box

Figure 1.—Carbon dioxide ice box with thermos for transporting graft to operating room.

would be more convenient because it would enable storage of grafts in a rack in the upright position. Smaller glass containers may be used but these necessitate bending or coiling of the graft.

Grafts from the carbon dioxide box are carried to the operating room in a thermos container (Fig. 1) in order to prevent thawing until it is certain that they will be used. This prevents wastage.

Carbon dioxide, which is obtained from a local agent,‖ is added as necessary. Ordinarily, three deliveries a week are required. During the past year our refrigerator has required approximately 450 lb. of dry ice a month. If it appears that grafts stored in this manner are not to be used by the end of six months, they are processed for freeze-drying in order to prolong the storage time.

Freeze-drying Method — The apparatus that we use to freeze dry grafts is the same as that employed by Hufnagel and associates.[2] A modification of the type used in commercial food processing (Fig. 2), it consists in a series of glass doublets¶ connected to a vacuum system. A number of less complex units have been described.

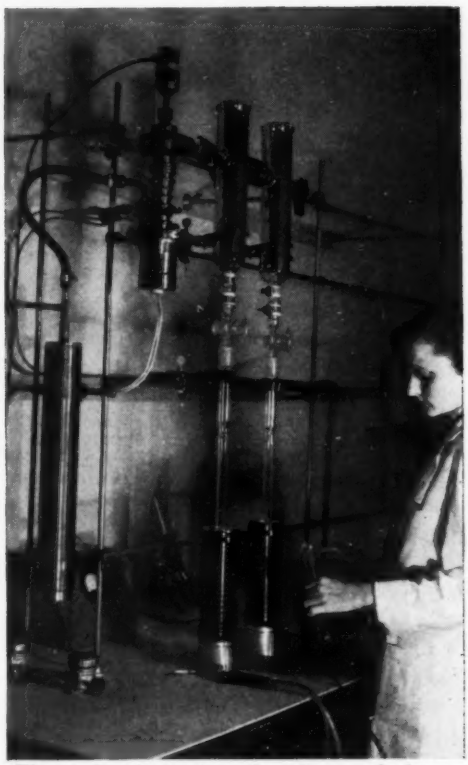

Figure 2.—Apparatus for freeze drying arterial grafts consisting in a series of glass doublets connected to a vacuum system.

The arterial segment in a long pyrex tube¶ is immersed in a bath of alcohol and dry ice and subjected to drying in a vacuum, which is produced by means of two pumps,** a mechanical one that creates a vacuum of about 5 microns and an oil diffusion pump that further reduces the pressure to approximately 1 micron or less. After two or three hours the alcohol-dry ice mixture is removed from about the tubes containing the grafts, and drying is allowed to continue for another six to eight hours. The tubes are then sealed by means of an oxygen torch. This

‖ Pure Carbonic Co., New Orleans, La.

¶ J. M. Ballingal & Associates, 307 Colorado Bldg., Washington, D. C.

** Central Scientific Co., Chicago, Ill.

last step is not easy since the tubes are thick walled and large in diameter. The glass must be heated evenly and the downward pull must be even, less leakage occur through a fracture of the glass seal. Should this occur, drying must be repeated. A stopcock sealed with vacuum grease, which will allow the tube being sealed to be isolated, is invaluable in preventing loss of vacuum in the rest of the system, should the heat sealing be faulty. The difficulty of sealing these thick tubes under vacuum conditions may be obviated by arranging to flood the system with an inert gas such as nitrogen if desired. The vacuum is checked by means of an ionoscope** and the top of the tube is further sealed against leakage by means of wax. Grafts prepared in this way may be stored at room temperature for an indefinite period. They may therefore be handled and shipped more easily than those stored in the carbon dioxide box.

A graft, vacuum sealed in a pyrex tube, is white and brittle, and suggests a clay pipe (Fig. 3). It can readily be reconstituted, however, to a consistency and appearance indistinguishable from a fresh vessel by immersion in normal saline for a few minutes. A graft that has been stored in the carbon dioxide ice box, on the other hand, is best allowed to thaw slowly for fifteen or twenty minutes before immersion in saline, lest the sudden temperature change fracture elastic fibers and other tissue structures.

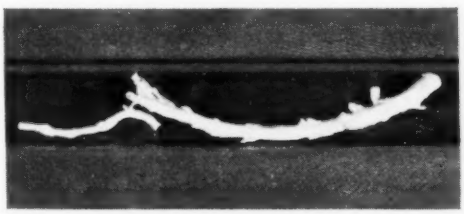

Figure 3.—Graft vacuum sealed in pyrex tube. Note brittleness and whiteness.

FUTURE POSSIBILITIES

Establishment and management of an artery bank†† is obviously time consuming and expensive, particularly if the freeze drying method of storage is employed. In addition to supervision by competent and interested medical personnel, a technician trained in processing and storing the grafts, and in recording the material is ideal. It is questionable at present whether the number of grafts in a community the size of New Orleans is sufficient to justify a full time technician. The suggestion that a technician with similar duties at the eye bank be employed for both tissue banks is under consideration.

Any project envisioning establishment of an artery bank must take into consideration the real possibility that ultimate discovery of an ideal plastic prosthesis would render the need for homografts obsolete. Whatever the ultimate decision may be, it is at present generally conceded that the preponderance of evidence is in favor of the homograft. Until this opinion is reversed, the need for an artery bank is real and at times urgent.

ACKNOWLEDGEMENT

The invaluable assistance of the Department of Biophysics, Tulane University School of Medicine, is gratefully acknowledged. Without the cooperation of Dr. Robert Nieset and Mr. L. DeLuca the artery bank could not have become a reality.

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** Central Scientific Co., Chicago, Ill.

†† A committee composed of Drs. Howard Mahorner, J. D. Rives, Allen Goldman, Rowena Spencer and the author is studying the possibility of establishing a community bank.

HEAD PROSTHESIS IN FRACTURES OF THE FEMORAL NECK *

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The ideal result which we seek in the treatment of all fractures is to return the patient to ambulation and a useful life as rapidly and as inexpensively as possible. This ideal can be readily achieved in the majority of fractures involving the upper extremities because these extremities are non-weight bearing. Because of our ability to change weight bearing alignment through the spine by means of braces or casts, it is possible to ambulate patients with certain vertebral fractures within a matter of days from the time that they sustain injury. In fractures of the lower extremities, the strain, thrust, and impaction forces of weight bearing require more nearly complete degrees of bone healing and, consequently, relatively long periods of time before weight bearing can be permitted.

Of these lower extremity fractures, the fractures of the neck of the femur create a constantly recurrent problem because of the number of such cases, because of the long period of morbidity before healing occurs and because of the difficulty of obtaining consistently good results. They are problems not so much from a standpoint of how to get the fracture reduced or how to hold it reduced. They are problems because of the nature of the blood supply to the head of the femur. Since this blood supply to the head of the femur comes up through the neck from the trochanteric region, a fracture of the neck of the femur cuts off the blood supply to the head and the head fragment will not heal no matter how well or how thoroughly the hip is fixed until this blood supply is adequately re-established.

I have heard physicians tell patients that they can walk within two or three months from the date of nailing of a fractured hip. This is an interesting concept, the origin of which is unknown to me because a survey of a large series of these cases shows that healing is not sufficient to permit weight bearing within less than, as a rule, six months and the cold, hard facts of the matter are that frequently nine to twelve months are required before healing is sufficient to properly allow weight bearing. Even after such prolonged periods of disability and inactivity, healing is frequently still insufficient to allow adequate weight bearing and avascular necrosis of the head of the femur supervenes.

Every doctor who treats fractured femoral necks states that he gets good results and yet there are a number of patients whose end results are very, very poor indeed. Their number is so great that this fracture has been alluded to as "the unsolved fracture".

In an attempt to solve the problem of the fractured femoral neck, two lines of action are generally followed. The first is that which is generally considered "conservative". It consists of some form of open or closed reduction and internal fixation. This is followed by a period of a varying number of months of inactivity and, when healing does not occur, various remediable osteotomies can be performed and, after another period of disability, the weakened patient, whose joints are stiffened with disuse, can gradually begin a resumption of activity. This is all too frequently the pattern of the conservative treatment of fractured femoral necks.

Because of the generally good results obtained from the various osteotomies, some surgeons have used these osteotomies as the primary treatment of the fractured neck. Oddly enough the result of the osteotomies used as a primary treatment are not as satisfactory as when they are used in the treatment of a hip fracture that has "gone bad". The reason for this is that in the hip fracture which has "gone bad", the hip muscles are so weakened that they do not constitute an active displacing force on the various bone fragments involved in the osteotomy. In a fresh fracture, these muscles still have active tone and tend to

* Presented at the Seventy-sixth Annual Meeting of the Louisiana State Medical Society, in Alexandria, April 25, 1956.

displace the osteotomy fragments so that even with internal fixation, it is almost impossible to maintain proper alignment of the fragments unless the patient is immobilized in a one and a half spica for about two months. This cast immobilization is, of course, very undesirable and is one of the things we try to avoid in the treatment of fractured hips.

PROSTHETIC CONSIDERATIONS

For some years now, a number of doctors have tried to get around the problem of the healing of the fracture of the femoral neck by substituting an artificial head of the femur and by having this prosthetic device articulate in the acetabulum, the body's weight being transmitted to the distal shaft of the femur, thus ignoring the problem of the healing of the bone and permitting ambulation of the patient within a matter of days from the date of surgery. There have been a number of good results with this type of treatment and there have also been a number of poor results. Some of the earlier prosthetic appliances were made of plastic and it did not take very long to show that plastic does not hold up well in the human body. At the present time, nearly all are made of two metals, stainless steel and vitallium, both of which are well tolerated by the body.

The simplest of these devices consists of a rounded head on a short shaft and, I believe, you will find that the greatest number of unsatisfactory results have been obtained from this type of appliance for the simple reason that adequate support of the thrust of weight bearing is not obtained with prostheses of this type.

The trend at the present time is to prostheses which have a shank which fits into the upper portion of the medullary canal of the bone and a flat shoulder or ledge which rests against the upper portion of the base of the neck of the femur which then functions as an abutment for the transmission of the thrust of weight bearing. Appliances which do not have this shoulder or ledge have been found to knife downward into the upper portion of the shaft of the femur as the patient walks, and are generally not satisfactory. There are a number of variations of this appliance, which is the Eicher prosthesis, namely, the F. R. Thompson, the Moore, and the Scuderi, which has a separate head.

There are three surgical approaches used for the insertion of these appliances. The posterior, the lateral and the anterior. The posterior approach is the deepest and the bloodiest and involves working along the deep posterior border of the acetabulum. I believe it is the least satisfactory. The lateral approach involves the detachment and the re-attachment of two of the hip muscles, the gluteus medius and minimus, and, I believe, it is generally wise to allow some time for healing of the re-attachment of these muscles prior to permitting ambulation. I have universally used the lateral approach and I usually wait five days postoperatively before ambulating the patient. The surgeons who have used the anterior approach find that they can put in these appliances with the detachment of only the posterior attachment of the rectus femoris muscle and they feel that ambulation can be permitted on the day following surgery.

Now, as with all operations, there are certain complications which occur with the insertion of a hip prosthesis. The most common of these is a dislocation of the prosthesis from the acetabulum. I believe this has most commonly occurred in cases in which the anterior approach has been used. With this approach, it is necessary to completely detach the capsule of the hip joint from the trochanteric region and this detachment, I believe, lessens the stability of the head of the prosthesis within the acetabulum. The total sectioning of the capsule has the advantage of sectioning many of the sensory nerves of the hip and probably gives a more pain-free hip. In the lateral approach, only the anterior portion of the capsule is opened and dislocation is a much less common occurrence. An added refinement to this approach is to section the posterior sensory nerves to the hip joint to lessen postoperative pain or discomfort. The posterior approach would

automatically take out the posterior sensory nerves to the hip, leaving the anterior sensory nerves.

CASE PRESENTATIONS

Now, what actually can be offered a patient who has a fractured femoral neck by the use of one of these prostheses? First, if the patient has had the usual so-called "conservative" treatment and the fixation has "gone bad", he may obtain a more rapid return to ambulation by the use of one of the prostheses than can be obtained by the osteotomies. The following are three such cases:

Case No. 1: Patient "C" sustained a fracture of his right hip in March 1954. An open reduction and internal fixation was performed and in May 1954 it was obvious that the nail was being extruded and that there was non-union of the fracture. An Eicher prosthesis was inserted in June 1954. The patient was able to get up and begin walking three weeks after the operation and returned to work about eight weeks after the operation. He is now working as a barber in a local hotel and an x-ray of his hip joint made in August 1955, about fourteen months after the prosthetic insertion shows no arthritic reaction about the acetabulum and no adverse reaction of the bone about the shaft of the prosthesis.

Case No. 2: Patient "M" sustained a fracture of the neck of her left femur in August 1953; it was nailed. Fixation was poor and it was soon obvious that nonunion was impending. An Eicher prosthesis was inserted in September, and the patient began walking two weeks after the insertion of the prosthesis. She is now working as a secretary. I have no recent x-rays on her since she is not a resident of New Orleans. When I last heard from her, which was about one year ago, and two years after the insertion of the prosthesis, she stated she was able to get about and do her work and that she occasionally experienced discomfort in her left thigh.

Case No. 3: Patient "B" sustained a fracture of her left hip in January 1953. An open reduction and internal fixation was performed and this "went bad" with absorption of the neck and extrusion of the nail up through the head, by April of the same year. In May, an Eicher prosthesis was inserted and the patient began walking three weeks after the operation. She was readmitted to the hospital in January 1955, one and a half years after the insertion of the prosthesis, because of a heart attack and x-rays which were made of her hip at that time show no abnormal reaction about the prosthesis.

After their return to ambulation, these patients all had one common question, and that was "Why had the prostheses not been used initially?" It is a very logical question and it sounded rather silly to tell them that they had to have the fracture fixed and then wait until it "went bad" before something could be done which would allow them to return to weight bearing again within a matter of weeks.

This next case demonstrates what can be accomplished in the initial prosthetic treatment of a hip fracture in comparison to the "conservative" internal fixation.

Case No. 4: Patient "L" had had a fracture of the neck of her right femur. An open reduction and internal fixation had been performed and the hip had healed. It took only ten months from the time of injury until she was again able to begin walking. Then, after walking for several months, she fell and broke the neck of her left femur. Needless to say, she was quite depressed at the prospect of spending another ten months in a wheel chair. An Eicher prosthesis was inserted and she began walking five days after the operation. She experienced some breakdown of the subcutaneous fatty tissues and on the eighth day had to go back to bed rest for about five more days. Since that time she has been walking actively. The left leg was initially longer than the right one, but her leg lengths are now equal. She states, at this time, that her hight hip is painful and her left one is not.

Following are case histories in which the appliance was used on recent fractured femoral necks:

Case No. 5: Patient "G" had a fracture of her right hip in June 1955. An Eicher prosthesis was inserted and she has been walking since five days after the date of surgery. This operated leg is longer than the other because of a high insertion of the prosthesis. An x-ray made on her in August of 1955, after she had been walking for two months, showed no abnormal bone reaction about the prosthesis.

Case No. 6: Patient "O" had a fracture of her left hip in June 1955. She came into the hospital in July, after the fracture was six weeks old. An Eicher prosthesis was inserted and she has been walking since five days after the date of operation.

Case No. 7: Patient "H" fell in July 1955, and sustained a fracture of the surgical neck of her left humerus, a compression fracture of the body of the twelfth dorsal vertebra and a fracture of the neck of the left femur. An Eicher prosthesis was inserted. A body brace was obtained and she has been walking since the fifth postoperative day.

What are the surgical complications of

the insertion of a prosthesis? The first complication about which we worry is that of infection and the answer to that is good surgical technique. The second complication is thrombo-phlebitis and its occurrence is certainly no greater in this operation than in any form of treatment of hip fractures. I believe that it is actually lessened by our ability to ambulate these patients in the immediate postoperative period. The next is some discrepancy in leg length. Next is the complaining of a constant dull pain or ache in the hip joint, of a degree which closely parallels the pain of which a number of the so-called "conservatively treated" cases complain.

CONCLUSION

I do not believe that prosthesis should be used in obese or very heavy individuals and, I feel, that young individuals with femoral neck fractures should have their fractures primarily fixed internally.

It so happens that most hip fractures are in the elderly range group, and that very obese individuals do not commonly live long enough to be very aged. In this older group, it has been my experience that the results obtained with initial insertion of a replacement prosthesis are better than those obtained by internal fixation and, in cases which have had internal fixation with an unsatisfactory result, the use of a prosthesis generally gives quicker results than is obtained with an osteotomy.

The majority of the prosthetic appliances which are in use today attempt to reconstruct the normal anatomy of the head and neck of the femur and I note that the more successful appliances are shortening the necks and straightening up the heads so that the forces of weight bearing on the femoral shaft are more those of direct impaction than of a levering side thrust and I believe, in the future, we are going to see these appliances changed still further, so that the head and neck of the appliance will be almost directly in line with the shaft portion of the femur so that a straight line of thrust is obtained downward from the acetabulum onto the shaft of the femur, the angle through the neck being almost entirely eliminated.

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DELUSIONS OF DERMAL PARASITOSIS (ACAROPHOBIA) MANIFESTED BY FOLIE A DEUX

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NEW ORLEANS

The current trend toward closer integration of the sundry medical specialties is, we believe, well pointed up in the following case for presentation.

This concerns a mother, aged 71 years, and her daughter, in her thirties, who presented themselves at Charity Hospital in September 1955. They were referred to the dermatology service by the admitting officer with the message that insects were flying in and out of the skins of both. The house physician who initially examined these patients confided to one of the dermatology residents that he had clearly seen an insect fly into the skin of one of these women. In justice to him, it must be said that these individuals were extraordinarily persuasive. They believed fervently, and with utter conviction, that they were both infested with parasites that could be seen and felt. They were in absolute agreement regarding the nature and behaviour of their particular and common infestations. Their demeanor was exceptionally courteous, and their request for assistance, genuine.

The mother was neat, gray haired, and did not look her 71 years. She was rather heavy set with good carriage. She spoke forcefully, surely and quickly. Her body was covered with scars and sores, some of which had become infected. The daughter

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presented a picture of extreme neatness and appeared older than her admitted age. She was thin and rather round shouldered. Much more cautious than her mother in answers to questions, she stated that she did not easily trust people, and further, that she could generally tell what people were thinking by studying them. This, she believed, was due to her father's Indian ancestry, which, though quite remote, additionally endowed her with unusually stoic qualities. She was a proficient seamstress, quite proud of her work. She never wanted to marry, because she was too independent.

The present illness began in the spring of 1955 when the neighbor's cocker spaniel developed sores. This dog, which was their only visitor, would not stay away from their home. Around some of the sores they noted lice. The lice were next observed in their house. One louse bit the daughter and this biting was witnessed by the mother. They immediately had the house fumigated and inspected thereafter by the health department and advised the police and dog catcher of this state of affairs. They then went to their family doctor who had at first treated them sympathetically, but later asserted that they were imagining things about insects. During the following six months they went to 104 doctors, including a veterinarian who diagnosed this as a dog louse infestation with which he was unfamiliar.

During the first interview the daughter vividly described what she called worms, and drew a picture of one. The worm was one-eighth inch long, having two sharp prongs on its head, with an oval shaped, cream colored body and carrying eggs on its back. They were hard, rubbery and not easily killed, for any remaining part was able quickly to regenerate the whole animal and dig deeply into the skin. These worms were extremely tenacious. Even if one were grasped between the fingers, the remaining part of the worm would adhere to the body surface. With traction the entire body would become very rubbery and break after stretching, leaving some portion of the worm adherent to the skin. Both could predict emergence of the parasite from the skin by a warning tingle. They stated that the worms occupied various body orifices. According to the daughter former examinations by physicians were made by digging a plug from the arm and squashing it on a slide, thereby ruining any chance to see the worm. Other mistakes made by physicians included searching for parasites in the wrong areas or at improper times. All of our permitted examinations were also negative for any parasites. Skin biopsies primarily requested by the patient were never permitted when things got to the stage of performance. If other measures failed, the women would and did flee and later return.

They stated they spent hours every night rubbing various ointments and antiseptics on each other and examining and cutting out with a razor any tingling spot on one by the other. The worms were very active at night. The patients slept late in the morning.

The only significant past history was that in 1953 the daughter had a period of hospitalization in Texas for mental illness. The daughter was an only child. After the father's death in 1944 she returned home and remained with her mother. The patients asserted that they lived harmoniously together and that they were fortunate that each could assist the other in removing the worms from areas which would otherwise have been inaccessible. An aunt gave a picture of intense domestic disharmony both before the father's death and at present.

Examination revealed hundreds of grossly mutilated, pinched, excised and excoriated lesions in both, with some secondary infection present in many areas. Slide studies of lesion material were negative. Clinical evaluation by the dermatological staff resulted in the opinion of delusions of dermal parasitosis of the folie à deux variety. These patients would not see a psychiatrist or have a Rorschach examination.

This case report is presented to illustrate a rather unusual occurence. It is by no means unique. Departments of Tropical Medicine and of Dermatology receive letters from time to time, from individuals who are the victims of delusions of parasitosis. Such letters are characterized by certain features: they are rather lengthy, yet neatly written; they plead for assistance in a heart rending fashion; the life cycles, the methods of reproduction, the tenacity of life of the parasites, the details of distribution are all organized in a systematic fashion; they often offer to provide specimens of their selection; and finally they indicate that they have seen a multitude of physicians of little skill and less patience.

An example of one recently received by Tulane University School of Medicine follows:

"Gentlemen:

Some eight months ago I or my wife contracted what has been diagnosed by three doctors, one a dermatologist, as Central American sand fleas, the pregnant female, in other words —if you can make this out from my spelling— dermatialathasis Nautileuas. We have been to our home doctor, County Health officer, two dermatologists, state health officer and upon his request I went to the U. S. Public Health Service Hospital at Lexington, only to be told very harshly that they only treated narcotic addicts and not nuts. We have to our knowledge passed these fleas to no less than six other persons and God knows how many more had them, but what are we to do? No one seems to know what to do and better yet, they seem not to care to learn. Some have advised us they were afraid to have us in their offices. We are neither paupers nor wealthy—I am an electrician—but we owe no one for services. The following had been tried by us extensively: ointment with a coal tar base, ointment with an acid base, ethyl-chloride, mange cure and sulphur with oil or grease base. These scavengers are in everything we have contacted, our furniture, all over our home, in the upholstering of our cars etc., etc. Some of the treatments seemed to bring out the fleas but since no one knew what to fumigate our home etc. with we, of course, again caught them. I find by spraying with ethyl-chloride for some ten minutes on one flea, that even this freezing will not kill them. Some were corked in an air tight bottle for two months to find we had more and yet very much alive. Boiling water will not kill them. One Dr. advised picking out at the point of entry. I tried this. In one small place on my hand I pulled them out all night and believe it or not, the next morning I had more than there were upon starting. I realize this is most probably not the proper channels for help but you must believe me, no one seems to have any interest in our cases and they are serious. My wife had large ulcers on her legs from wounds received in an automobile accident two years ago and these fleas are in these ulcers. I am afraid she may lose both legs if help is not found and very soon too. We are in dire need of knowledge of these things to keep from spreading them further and some way get free of them ourselves. We most certainly don't wish to spread them. Can't you help us? If your answer be in medical terms we can't understand we will carry it to any Dr. you specify.

Please sirs, can't you advise or aid us? If any treatment is known that is successful it seems it will have to come from you. Why no Dr. we have been to doesn't seem to take any interest we can't understand, unless these cases are so rare they just don't care to know anything about them. I beg of you, can't you help us. Any charges we will gladly care for if successful treatment can be found. Also how to exterminate them from our furniture, etc. In advance we are most grateful for any advice.

Very sincerely,
V. J. W.

P.S. I spent three and one half years in the Southwest Pacific in service during World War 2 if this helps."

DISCUSSION

Physiological responses of the skin to psychic and emotional influences are well known. Among these are blushing, blanching, lividity, sweating, and goose flesh. There are, moreover, true dermatoneuroses including neurotic excoriations, trichotillomania, onychotillomania, dermatothlasia, and at times factitial dermatitis. Those most closely allied to delusions of parasitosis are dermatothlasia which is characterized by an uncontrollable desire to rub or scratch repeatedly one or more areas of the skin; and neurotic excoriations, in which condition the individual excavates rather than scratches the skin. These neuroses lack organized delusionary features. When neurotic excoriations are the result of the individual's conviction that parasites infest his skin, the transition has then been made into delusions of dermal parasitosis.

Mutilation is severe when these efforts to remove the infesting organisms become frenzied. According to Wilson and Miller delusions of parasitosis is a symptom complex and not a disease entity. It is not sharply demarcated from other delusions but merges imperceptibly with them. A delusion is a fixed and organized belief or judgement contrary to demonstrable fact. It is merely an unreal, unfounded conviction and lacks the externalized object perception contrary to reality that characterizes the hallucination. The delusion is of great psychiatric significance and frequently accompanies the most profound mental disorders. The prognosis in delusions is poor. They are often part of a paranoid personality pattern.

When the patient perceives something that cannot be perceived by others he is suffering from an hallucination, which is a serious symptom. If this is on a toxic basis, as in alcoholic delirium tremens, the prognosis is good. Dr. Rufus Craig has kindly furnished us with details of such a case in an alcoholic physician.

"Dr. S., age 44, was admitted to the Alcoholic Rehabilitation Service of Charity Hospital following a prolonged, severe, drinking debauch. The first night on the Service he developed mild D.T.'s with primarily visual hallucinations, namely green worms crawling up his legs. Even so, the good doctor, whose mind remained steadfast to his scientific training, obtained a specimen bottle from the ward laboratory and caught one of these 'critters' which he placed in the lab. with a note to the extern to please identify it in order that he could receive the proper treatment."

If it is not associated with some reversible toxic or febrile state, the prognosis is, at best, a guarded one.

Phobic patients are those who are unduly afraid. These patients realize that they are not justified in their fears. Phobias can and do affect the skin and are exemplified in the patient whose every skin spot is a malignant, leprous, or luetic affliction. The prognosis is fairly good, not with regard to cure, but toward a successful adjustment, although phobias may at times become disabling. Phobic patients have a persistent fear of contamination. They are, however, able to accept the irrationality of their fears upon presentation of laboratory proof; their intellect accepts what their emotions cannot. It is believed by certain psychoanalysts that phobias indicate greater emotional maturity, hence are more amenable to therapy, than are the delusions.

The obsessive compulsive patient cannot refrain from thinking or acting in a given fixed pattern. These are the perfectionists, whose efforts to rid themselves of small blemishes may result in considerable trauma. They are arrangers, usually of higher than average intelligence, and of more fragile than usual emotions. These patients are well equipped to suffer. Their prognosis is good for containment, but they may develop paranoid states when psychoneurotic drives are not contained.

Delusions of parasitosis almost invariably occur in but one patient at a time. The case and letter herein presented represent instances of folie à deux. Contagious delusions of parasitosis have also been reported by Giacardy and by Wilson and others.[10, 13, 16]

Folie à deux, a term coined by Lasègue and Falret in 1877, is a psychosis shared by two persons. According to Lasègue and Falret the contagion of the folly requires special conditions.

"One of the individuals is the active element; more intelligent than his associate, he creates the illusion and imposes it successively on the second person, who is the passive element. The latter resists at first, then submits little by little to the pressure of his congener, all the while reacting in turn on him, in a certain measure to rectify, amend and coordinate the delusion, which then becomes held in common and which they repeat to all comers, in the same terms and in an almost identical fashion. In order that this intellectual task may be accomplished simultaneously in two different minds, it is necessary that these two individuals have lived, for a long time, a life absolutely in common, in the same place, partaking of the same mode of existence, the same sentiments, the same interests, the same fears and the same hopes, and beyond outside influences. The third condition, in order for the contagion of the delusion to be possible, is that the delusion have the character

of probability; that it be maintained within the limits of possibility; that it rests on past experience, or on fears or hopes conceived for the future. This condition of probability alone permits it to be communicated to an individual and permits the conviction of one to be implanted in the mind of the other."

Gralnik subdivided folie à deux into the imposed, simultaneous, communicated and induced types. In the imposed type the delusions of a psychotic individual are transferred to a mentally sound one, but it is necessary for the persons to be intimately associated and free from counterbalancing influences. The delusions further tend to disappear in the infectee as soon as the two are separated. In the simultaneous type two people morbidly disposed happen to become mentally sick at the same time. Here, too, a long association helps causation, but separation does not clear up either one. This type was originally described by Regis. In the communicated type the psychosis is communicated after some resistance but is fully developed in the second person and does not clear upon separation. This type was originally described by Marandon de Montyel in 1881. The fourth type is the induced variety, first described by Lehman in 1885. In this type the recipient individual already possesses his or her own delusions. There then occurs a numerical addition of delusions from another or primary agent.

Only a small percentage of the cases of folie à deux affect the skin. One of us has observed examples of folie à deux manifested by delusions of intestinal parasitosis. Freyhan states that folie à deux must indeed be a rare condition, since in comparison with the great number of people exposed to others with delusions, only a few acquire them. He further stated that it is likely that a special vulnerability of a recipient is a prerequisite in order that he may become infected psychiatrically. Noyes commented that folie à deux most frequently involves women. This is probably because women are supposed to play passive and submissive roles. Folie à deux commonly involves mother and daughter, two sisters, or husband and wife. As misinterpretations, delusions and ideas of persecution increasingly disturb the infector, they are persuasively and persistently related to the infectee.

MANAGEMENT

Patients presenting themselves to physicians with the conviction that they are the victims of infestations are entitled to thorough physical and laboratory studies. Parasitologists are well aware that mite infestations are readily overlooked by naked eye examinations. To avoid embarrassing postures the clinician requires not only some familiarity with local ectoparasites, but also the use of a magnifying lens.

After it has been decided, following adequate investigation, that no parasites are present, then the problem is a psychiatric one.

In dermatological folie à deux, the treatment is the same as in other cases. The prognosis, while uniformly guarded in these cases, is not to be considered hopeless, as the outlook will entirely depend upon the nature of the basic psychiatric illness of which the delusion is but a symptom. Partridge reported the cure of three people, a case of folie à trois. This cure was accomplished with one operation, a prefrontal lobotomy performed on one individual who was the infector. The other two people as well as the one operated upon were cleared of their delusions. Electroshock therapy has cleared cases of folie à deux.

SUMMARY AND CONCLUSIONS

An example is presented of dermal delusions of parasitosis manifested as folie à deux, in a mother and daughter. Both women were convinced that bizarre worms were infesting their skins; unsuccessful attempts to remove these imaginary creatures led to much mutilation and excoriation. They saw 104 physicians, in a six month period. Delusions of parasitosis is a symptom complex which merges imperceptibly into other delusions. It is of serious psychiatric implication. Folie à deux is a psychosis shared by two persons. The

combination of these two psychiatric conditions is unusual but has been previously reported by Giacardy and by Wilson. Patients presenting themselves to physicians with the conviction that they are the victims of infestations are entitled to thorough physical and laboratory examinations. When it has been established that no parasites are present, the problem is a psychiatric one.

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B. FOLIE A DEUX

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DISCUSSION

Dr. John D. Krafchuk, New Orleans: Dr. McAndrew is to be commended for his authoritative presentation of a topic for which he is so eminently qualified, with advanced training and experience in both Dermatology and Psychiatry, a rare and very useful combination.

The interrelationship between diseases and functions of different systems of the body is coming to be recognized and appreciated more and more as medical knowledge increases. With internal organs of the body, the influence of one system upon another may be somewhat obscured by the inaccessability of organs involved. The position of the skin, one of the largest organs of the body, on the surface, readily examined and biopsied, has lead to recognition of the significance of a number of cutaneous manifestations of internal disease, such as acanthosis nigricans for internal malignancy, and erythema nodosum for certain internal infections. Dr. McAndrews' presentation demonstrates a primary disease of the central nervous system presented for medical care because of skin lesions. In these psychotic patients, no therapy to the skin is of any avail; the only hope for these patients lies in the correction of the basic psychosis.

The relationship between functional activity of the nervous system and the skin is very close. The nonmedical person is acquainted with such emotional reactions as blushing, sweating, pallor. A number of commonly seen chronic dermatoses, such as psoriasis, eczema, and lichen planus, have well recognized psychic components, although the emotional factors are felt to serve as aggravating factors rather than actual cause. In these conditions, treatment by the dermatologist may have an inherent measure of psychotherapy, by inspiring confidence and the assurance that the condition will get well.

The type of case presented by Dr. McAndrews, however, presents a distinct problem. The patients described are basically psychotic, the skin lesions serving only as indications of the underlying mental state of the patient. Local or systemic treatment directed toward the skin serves no purpose other, perhaps, than control of secondary infection. It is very difficult to convince these patients of the true nature of the condition. In fact, it may be well not to attempt to, since, being basically psychotic, they might direct their abnormal behavior in other more dangerous directions. A case is known where the patient, finally convinced after great effort that his skin disease was self produced, went off and committed suicide.

A recent paper by Aleshire in the May 15 1954, issue of the Journal of the American Medical Association, describes four patients with delusions of parasitosis who had histories of poor nutrition. High vitamin and protein diets corrected the psychic abnormalities, and the delusions of parasitosis disappeared. While nutritional factors may not apply to all cases with acarophobia, it is worthy of consideration where the mental disease might be on a toxic or subnutritional basis.

A point made by Dr. McAndrew might be emphasized—that it is important to make certain that there actually are no insects in a given case, even though the neuropsychiatric aspects of the case seem convincing. A true story recently heard at a Dermatology meeting illustrates this point. A social worker for a large psychiatric department noted recurrent severe urticaria, felt to be basically a neuropsychiatric problem, since eruptions routinely followed arguments with her fiancé. The dermatologist, who had been asked to prescribe an anti-pruritic lotion for symptomatic effect, while she was being treated psychiatrically, insisted on examin-

ing the patient against strong objections. He diagnosed the lesions as insect bites. Investigation then showed that there were bed bugs in the bed of the young lady, and that she slept at her own apartment only during the periods when she and her fiancé were not on speaking terms after arguments. Elimination of the bedbugs quickly solved the psychiatric problem.

CESAREAN SECTIONS: A REVIEW OF ONE THOUSAND CASES IN A PRIVATE HOSPITAL*

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This is a study of 1000 consecutive cesarean sections performed in the Southern Baptist Hospital, New Orleans, from January 1st, 1951, through January 7th, 1955. During this time there were a total of 14,891 deliveries. A breakdown as to the yearly incidence and indications will be shown and an analysis of incidence, morbidity, indications and neonatal and stillborn mortality will be included. As is frequently the case, the cause of morbidity is not always easy to determine. In a series we find frequent cases in which patients fit the classification of morbidity, but there are no known causes that appear in the chart. Since cesarean section is a major abdominal procedure, often performed on a patient physically exhausted from a prolonged trial of labor, or suffering from an acute anemia due to hemorrhage or severe pre-eclampsia, it is no wonder that morbidity is frequent.

INCREASE IN INCIDENCE

A review of the literature on cesarean sections showed that all authors have noted a steady increase in incidence. Broadening of indications for cesarean section have brought about a decrease in fetal and maternal mortality. The claims are that this changing attitude appears to coincide with the availability of chemotherapy, antibiotics, and blood banks. Another change has been the greater increase in the incidence of cesarean sections among private patients as compared with charity patients. Studiford and Decker[1] state that with the increased safety of the operation, it is natural to expect the greater frequency with which it is being utilized at the present time and broadening of the indications for its performance. Today, we find the fetal indications are greatly extended, with a growing tendency to supplant the more difficult type of vaginal operation with a cesarean section. In addition, it is being used to terminate pregnancies in which serious complications exist, in the interest of the mother, rather than the fetus.

Prematurity plays a large role in the higher fetal mortality rate in section because of severe maternal complications appearing well before term. A comparison of the fetal mortality rate in high and mid-forceps in Kistner's[2] report, as compared with that of cesarean sections, reveals that it has been much safer for the infant to have been delivered abdominally than by difficult operative forceps. It seems that the factors which make the operation safer, as listed by Conti,[3] that is, better technique, better anesthesia, antibiotics, blood transfusions, etc. will permit an increased period of delay before operation, and in some cases avoiding it entirely. This will, in some measure, prevent a too rapid rise in incidence. A high cesarean section rate is indicative of a lack of obstetrical art, or a disregard of the patient's future obstetric well-being. The subsequent rupture of a cesarean scar may not be included in the operator's statistics, but should certainly be his responsibility.

TABLE 1
INCIDENCE

Total deliveries	14,891
Total sections	1,000
Incidence	6.71%

In 1951, there were 237 sections, or an incidence of 7.02 per cent. In 1952, there were 215 sections, 6.05 per cent; 1953, 259 sections, 6.76 per cent, while in 1954, there were 287 or an incidence of 7.02 per cent. There has been a steady increase in the number of sections, but the incidence has

* Presented at the Seventy-sixth Annual Meeting of the Louisiana State Medical Society Alexandria, April 25, 1956.

remained fairly constant due to the increase in deliveries.

This compares favorably with another private hospital in New Orleans, Touro Infirmary. Meyer[4] reports an incidence of 9.2 per cent for 1,290 sections from 1949 to 1955.

TABLE 2
TYPE OF SECTION

Low cervical	885
Classical	65
Section hysterectomy	40
Extra peritoneal	10

As Table 2 shows, the tendency is predominantly for the low flap procedure. There is but little variation in the percent of the other procedures from year to year, with the exception of the extra peritoneal section (2 were performed in 1952, and 8 in 1954).

In conjunction with the 1000 cesarean sections, there were 181 sterilization procedures, including 40 hysterectomies.

TABLE 3
ANESTHESIA

Spinal	930
Ethylene-ether	33
Cyclopropane	30
Local (Novocaine)	7

With 93 per cent of the sections being performed under spinal anesthesia, one can see that spinals are no longer feared in obstetrics. This is due to several factors: improvement in anesthetic agents, qualified anesthesiologist, intravenous fluids, blood, stimulants and hypotensive agents.

TABLE 4
INDICATIONS

Previous section	509
Disproportion	213
Abruptio placentae	71
Placentae praevia	57
Cervical dystocia and uterine inertia	47
Elderly primipara	43
Pre-eclampsia	43
Transverse lie	24
Poor obstetrical history	18
Face and brow presentation	11
Miscellaneous	53

Of the 1000 sections reviewed, 509 or about 50 per cent were performed because of previous sections. The liberalization of indications for sections in recent years, therefore, is a contributing factor in the high incidence of sections at present. As regards the practice of allowing previous section cases to deliver vaginally in subsequent pregnancies, i.e., hemorrhage or malposition; in this series there were 6 ruptured uteri and 9 impending ruptures, a total of 15 partial, incomplete or complete ruptures of the uterus in 509 previous section cases, or approximately a 3 per cent incidence.

There was no maternal mortality in this series, though several of the cases of ruptured uteri were saved only by the modern era of good anesthesia, antibiotics, and blood banks. One patient experienced sudden, severe pain at home and within forty-five minutes was in the operating room receiving four blood transfusions simultaneously.

Indications for primary sections were: first, disproportion followed by abruptio placentae and placentae praevia; next in frequency were cervical dystocia and uterine inertia, elderly primipara and pre-eclampsia. These are the relative indications for section that are most frequently mentioned. Ofttimes one will find all three as indications in the same patient, i.e., a 36 year old primipara, thirteen years' sterility, pre-eclamptic with ruptured membranes; pitocin enhancement followed by secondary inertia and section.

TABLE 5
MISCELLANEOUS INDICATIONS

Bony pelvic distortion	9
Fetal distress	7
Ruptured uterus	6
Previous uterine surgery	6
Obstructing pelvic mass	5
Double uterus and/or vagina	5
Heart disease—Valvular or congenital	4
Prolapsed cord	3
Previous extensive vaginal plastic	3
Cervical stenosis or conglutination	3
Cerebral hemorrhage	1
Spinal cord tumor with paralysis	1

Under bony pelvic distortion were those due to previous fractures of the pelvis, to poliomyelitis as a child, osteitis imperfecta and one bone cyst of the pubis. The orthopedist feared a vaginal delivery would re-

sult in fracture of the pubis.

Previous uterine surgery consisted of myomectomies and hysterotomies. The obstructing pelvic masses consisted of cervical fibroids, ovarian cysts and a pelvic kidney. The sections for prolapsed cord all resulted in living babies.

TABLE 6
INCIDENTAL PROCEDURES

Tubal ligation	136
Myomectomy	12
Appendectomy	9
Salpingectomy	5
Hernia repair (umbilical)	4
Repair of bladder rent	3
Ovarian surgery	2
Uterine suspension	1
Breast surgery	1

These procedures were all performed in conjunction with, or at the time of, the cesarean section. To these may be added the 40 hysterectomies, though it is difficult to classify a hysterectomy as an incidental procedure.

The bladder lacerations were all discovered at the time and repaired without complications, other than cystitis. Two of these occurred during low cervical section, and the third during a total hysterectomy at the time of the third section. The breast surgery consisted of the wedge excision of a breast mass that on frozen section was diagnosed as an adenofibroma.

Maternal morbidity rates have been appreciably reduced in recent years. The rate for the 1,000 cases under study was 15.5 per cent—a total of 155 cases (19 per cent in 1951 to 10.4 per cent in 1954). This is an especially good result when compared with one recent study of 1,000 major gynecological operations, reported by Sellers, Ward and Davis[5] with a morbidity of 23 per cent. Again, credit for the improved statistics must be given to intelligent use of anesthetic drugs, prinsipally spinal anesthesia, adequate use of antibiotics and chemotherapy, frequently prophylactically, and blood replacement. Good prenatal care brings the majority of patients to the hospital in better physical condition than is usually encountered in a charitable institution.

Bryant,[6] in reporting on sections in Cincinnati, compared two groups of elective sections, one with prophylactic antibiotics, the other without. The incidence of morbidity varied 1.2 per cent in the two groups.

TABLE 7
FETAL MORTALITY

Total number of births (including 15 twins)	1015
Neonatal deaths	28
Stillborn	33
Gross fetal mortality	6.0%

Of the neonatal deaths, 10 were in association with praevia and abruptio, and 9 were prematures; while 20 of the stillborns occurred with praevia and abruptio, and only 6 were premature. Three of the stillborns were due to ruptured uteri.

With the increased incidence of sections, there is a decreased fetal mortality. Broadening the indications for section to include fetal indication, such as prolapsed cord, fetal distress, and supplanting the more difficult and hazardous types of vaginal deliveries with section have definitely lowered fetal mortality. The one factor that needs more help is the avoidance of prematurity. This is usually not preventable in the bleeding cases, although in labor they have had indications for section, but too many premature infants are delivered electively because of previous sections. This is why we need the continuation of consultations for previous sections, with the consultant examining the patient for fetal size and not depending on the EDC calculated from a woman's hazy memory of the date of her last menstrual period.

Although no attempt was made to tabulate the number of primary sections performed electively, without the patient having a trial of labor; one feels that too often, too great a dependence has been placed on x-ray pelvimetry. This refers specifically to cephalopelvic disproportion without trial of labor. Clinical evaluation, competent consultation and adequate trial of labor will result frequently in a normal vaginal delivery of a normal, healthy infant and prevent adding a scar to the

uterus and making a needless 'obstetrical cripple'!

Likewise, I am not advocating a return to the less than 1 per cent section incidence that could result in some infants being dragged through disproportionate pelves and cause extensive soft tissue damage to the maternal pelvis and brain damage to the infant.

SUMMARY

A review of 1,000 consecutive cesarean sections in a private hospital has been presented.

There was a section incidence of 6.71 per cent.

The low cervical type section was predominant with a decrease in classical sections and the section hysterectomies show an increase, as some surgeons are removing the uterus rather than ligating the Fallopian tubes when sterilization is indicated.

Slightly more than 50 per cent of the sections were secondary or repeat sections.

Fetopelvic disproportion, abruptio placenta, and placentae praevia were the three most frequent reasons for primary section.

There has been an increase in incidental surgical procedures performed at the time of cesarean section.

The fetal mortality (uncorrected) was 6.0 per cent.

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THE EVALUATION OF STREPTOHYDRAZIDE* IN THE TREATMENT OF PULMONARY TUBERCULOSIS †

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NEW ORLEANS

Streptohydrazide is a crystalline compound containing the equivalent of 1 gm. of streptomycin base and 236 mg. of izoniazid. Following the injection intramuscularly, concentrations [1] in the blood are similar to those following injection of 1 gm. of streptomycin, and satisfactory serum concentrations of izoniazid are also reported. Hobby [2] and Lenert have reported therapeutic effects in animals when given intermittently. Oral medications, in some instances, are not tolerated and the regulated dosage of the two most beneficial medications by injection are of distinct value.

Patients admitted to the L.S.U. Tuberculosis Service at Charity Hospital in New Orleans beginning February 4, 1954, were placed by rotation in one of the eight following protocols:

I. INH 300 mg./day plus PAS 12 gms. /day.

II. Streptomycin gms. 1/day x 30; then b.i.w. plus PAS 12 gms./day plus INH 300 mg./day.

III. Streptomycin, gms. 1/day x 30; then b.i.w. plus INH 300 mg./day.

IV. Streptomycin gms. 1/day x 30; then b.i.w. plus PAS 12 gms./day

V. Streptohydrazide gms. 1/b.i.w.

VI. Streptohydrazide gms. 1/day x 30; then b.i.w.

VII. Streptohydrazide gms. 1/day x 30; then b.i.w. plus PAS 12 gms./day

VIII. Streptohydrazide gms. 1/day x 30; then b.i.w. plus INH 300 mg./day

Routine laboratory work, consisting of blood count, sedimentation rate, urinalysis, blood urea nitrogen, icterus index were done every two months; seventy-two hour sputa concentrations and cultures were done on all patients every month. Routine 14 by 17 EPA chest x-rays, including other indicated views, were obtained at monthly and two month intervals.

Weight, cough, laboratory, x-ray and toxic manifestations were noted and ana-

* Supplied by Charles Pfizer, Co., to the L.S.U. Tuberculosis Service, Charity Hospital, New Orleans, Louisiana.

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lyzed as per tables 1 to 9.

OBSERVATIONS

Toxic Manifestations. — Nausea, diarrhea, dizziness, flushing, chills, fever, headache, hysteria, depression, pruritus, rash, palpitation, hematuria and joint pains occurred. Izoniazid had to be discontinued in 2 patients because of depression and nausea.

Streptomycin had to be discontinued in 4 instances because of: Nervous reaction, dizziness, rash and pruritus, and chills

TABLE 1
I.N.H. & P.A.S. — 12 PATIENTS

Weight	12 (86%) Gained 6 - 14 lbs.	Stationary 2	Loss 0
Cough	14 (100%) Decreased		
Laboratory	Urine: No abnormalities Sed. rate: 2 - 56 Icterus index: 4 - 37 (no clinical jaundice)		B.U.N.: 9 - 18 Hematocrit: 33 - 46
Sputum	8 (80%) Converted 4 - 8 weeks	Positive 2	Negative 4
X-ray	6 Cavities: 4 (66%) Disappeared 10 - 24 weeks 6 Clearing & contraction 2 Unchanged: 1 Oleothorax		2 Unchanged 1 Cystic bronchiectasis
Toxicity	1 Dizziness, hysteria, nausea and pruritus 1 Rash and pruritus		

TABLE 2
STREPTOMYCIN, P.A.S. & I.N.H. — 12 PATIENTS

Weight	11 (91%) Gained 9 - 55 lbs.		Expired 1
Cough	9 (75%) Decreased	Stationary 3	Increased 0
Laboratory	Urine: No abnormalities Sed. rate: 35 - 45 Icterus index: 3.8 - 28 (no clinical jaundice)		B.U.N.: 5 - 25 Hematocrit: 24 - 49
Sputum	10 (83%) Converted 6 - 12 weeks		Positive 2
X-ray	9 Cavities: 4 (44%) Disappeared 8 - 12 weeks 1 Plombage 1 Lobectomy 2 Nodular cystic 1 Expired 3 Clearing and contraction		
Toxicity	1 Depression and nausea - I.N.H. stopped after 8 weeks 1 Jumped from 4th floor window - still lives		

TABLE 3
STREPTOMYCIN & I.N.H. — 10 PATIENTS

Weight	10 (100%) Gained 4 - 21 pounds		
Cough	9 (90%) Decreased	Stationary 1	Increased 0
Laboratory	Urine: 1 Diabetic controlled Sed. rate: 6 - 50 Icterus index: 6.5 - 33 (no clinical jaundice)		B.U.N.: 8.2 - 19 Hematocrit: 34 - 52
Sputum	7 (78%) Converted 3 - 22 weeks	Positive 2	Negative 1 (Pott's)
X-ray	2 Cavities: 1 Segmental resection 7 Clearing and contraction 1 Pott's		1 Contraction
Toxicity	1 Rash and pruritus (controlled with benadryl) 1 Dizziness; streptomycin stopped & P.A.S. substituted		

and fever (streptohydrazide and INH substituted in 1 instance without return of symptoms). Streptohydrazide had to be discontinued in 3 instances because of tingling after 60 gms., vertigo 39 gms., and transfer of patient to mental hospital. PAS had to be discontinued in 3 instances because of nausea, chills and fever, and nausea and diarrhea. One patient could tolerate none of the anti-tuberculosis drugs used.

Deaths.—

1) Multiple abcesses; sputum converted

1) Addison's disease

Laboratory Studies.—

Sputa studies revealed conversions by culture in 50 to 91 per cent. There was little difference in the first 4 protocols

TABLE 4
STREPTOMYCIN & P.A.S. — 10 PATIENTS

Weight	8 (80%) Gained 7 - 34 pounds	Stationary 1	Unable to weigh 1
Cough	8 (80%) Decreased	Stationary 2	Increased 0
Laboratory	Urine: No abnormalities Sed. rate: 22 - 62 Icterus index: 3.1 - 26.7 (No clinical jaundice)		B.U.N.: 5 - 21.2 Hematocrit: 33 - 46
Sputum	7 (78%) Converted 4 - 16 weeks	Positive 2	Negative 1 (effusion)
X-ray	5 Cavities: 3 Decreased in size; 2 lobectomies 4 Contraction and clearing 1 Stationary		
Toxicity	1 Nausea; P.A.S. discontinued & I.N.H. substituted 1 Rash and pruritus; streptomycin discontinued & I.N.H. substituted 1 Chills and fever; streptohydrazine & I.N.H. substituted		

TABLE 5
STREPTOHYDRAZIDE GMS. 1 B.I.W. — 10 PATIENTS

Weight	9 (90%) Gained 2 - 31 pounds	Stationary 1	
Cough	7 (70%) Decreased	Stationary 3	Increased 0
Laboratory	Urine: No abnormalities Sed. rate: 14 - 55 Icterus index: 4.9 - 37 (no clinical jaundice)		B.U.N.: 7.4 - 25 Hematocrit: 33 - 51
Sputum	5 (50%) Converted 5 - 22 weeks	Positive 5	
X-ray	8 Cavities: 3 (38%) Disappeared (6, 11, & 12 months) 2 Unchanged		5 Decreased
Toxicity	1 Depression, excitation (stabbed patient)		

TABLE 6
STREPTOHYDRAZIDE GMS. 1/D x 30, THEN B.I.W. — 15 PATIENTS

Weight	12 (80%) Gained 5 - 40 pounds	Loss 2	Expired 1
Cough	15 (100%) Decreased		
Laboratory	Urine: 1 Diabetic controlled Sed. rate: 36 - 50 Icterus index: 4.5 - 26.4 (no clinical jaundice)		B.U.N.: 6 - 25.6 Hematocrit: 30 - 52
Sputum	8 (57%) Converted 4 - 52 weeks	Positive 6	Negative 1
X-ray	8 Cavities: 3 (37½%) Disappeared (4, 12, & 52 weeks) 6 Stationary 1 Expired		5 Unchanged
Toxicity	1 Vertigo 1 Tingling		

TABLE 7
STREPTOHYDRAZIDE GMS. 1/D x 30 THEN B.I.W. & P.A.S. — 12 PATIENTS

Weight	9 (75%) Gained 4 - 23 pounds	Stationary 2	Loss 1
Cough	8 (66%) Decreased	Stationary 4	
Laboratory	Urine: 1 Hematuria reaction to all chemotherapy Sed. rate: 28 - 56 Icterus index: 5 - 27.2 (no clinical jaundice)	B.U.N.: 5 - 27.6 Hematocrit: 29 - 61	
Sputum	7 (58%) Converted 5 - 25 weeks	Positive 5	Negative 2
X-ray	9 Cavities: 4 (44%) Disappeared 5 - 25 weeks 5 Clearing and contraction 2 Worsening 1 Clearing and contraction		
Toxicity	1 Headache and flushing 1 Vertigo 1 Chills, fever, palpitation and hematuria 1 Nausea, diarrhea; P.A.S. discontinued		

TABLE 8
STREPTOHYDRAZIDE GMS. 1/ x 30 THEN B.I.W. & I.N.H. — 13 PATIENTS

Weight	12 (92%) Gained 8 - 50 pounds	Stationary 1	
Cough	13 (100%) Decreased		
Laboratory	Urine: 1 Diabetic controlled Sed. rate: 13 - 52 Icterus index: 4.1 - 22.2 (no clinical jaundice)	B.U.N.: 7.4 - 20.2 Hematocrit: 32 - 50	
Sputum	10 (91%) Converted 4 - 16 weeks	Positive 1	Negative 2
X-ray	5 Cavities: 2 (40%) Disappeared 10 - 22 weeks 3 Contracted 2 Cystic 6 Clearing and contraction		
Toxicity	1 Joint pain, depressive reaction 1 Febrile reaction		

TABLE 9

	1 14 Pts.	2 12 Pts.	3 10 Pts.	4 10 Pts.	5 10 Pts.	6 15 Pts.	7 12 Pts.	8 13 Pts.
Weight Gain	12(86%) 6 - 14	11(91%) 9 - 55	10(100%) 4 - 21	8(80%) 7 - 34	9(90%) 2 - 31	12(80%) 5 - 40	9(75%) 4 - 23	12(92%) 8 - 50
Cough Decreased	14 (100%)	9 (75%)	9 (90%)	8 (80%)	7 (70%)	15 (100%)	8 (66%)	13 (100%)
Sputum Conversion	8(80%) 4 - 8	10(83%) 6 - 12	7(78%) 3 - 22	7(78%) 4 - 16	5(50%) 5 - 22	8(57%) 4 - 52	7(58%) 5 - 25	10(91%) 4 - 16
Positive	2	2	2	2	5	6	5	1
Negative	4	0	1	1	0	1	2	2
X-ray								
Cavities	6	9	2	5	8	8	9	5
Closed	4(66%)	4(44%)	0	0	3(38%)	3(37½%)	4(44%)	2(40%)
Toxicity								
Skin	2	0	1	1	0	0	0	0
Nerve	1	2	1	0	1	1	2	1
G. I.	1	1	0	1	0	0	1	0
Febrile	0	0	0	1	0	0	1	1

78 to 83 per cent, the greatest being in the last 4, 50 to 91 per cent. The reason for the difference is not known, as sensitivity studies were not done.

Routine blood counts failed to reveal evidence of abnormalities caused by any of the medications used.

The sedimentation rate proved of no value in our analysis.

The icterus index was unreliable. No clinical jaundice was noted in spite of the high values. Some of the specimens were hemolyzed, giving high values.

The blood urea nitrogen proved of no value in our analysis.

Hematuria was observed in only 1 instance where all medications were not tolerated. Transient traces of albumin were noted in 5 instances. Pyuria was noted once, and cleared spontaneously. Trace of sugar was noted in 3 instances; all cleared on re-examination. Three diabetics were controlled with the usual diabetic regime.

X-ray Changes.—

X-ray changes were also interesting in that the highest percentage of cavity closures, 67 per cent, was in the *INH & PAS group*. When all three drugs were administered there was 44 per cent closure similar to the streptohydrazide & PAS group. With streptomycin plus INH and streptomycin plus PAS no cavity closures occurred; whereas with streptohydrazide twice weekly and streptohydrazide daily for thirty days then twice weekly, cavity closure was identical, 38 per cent. Streptohydrazide daily for thirty days then twice weekly plus INH group showed a 40 per cent cavity closure.

SUMMARY

1. Streptohydrazide intermittently and in combination with PAS and INH has been compared with protocols using combinations of streptomycin, INH and PAS. Our findings suggest that its use is at least equal to the other combinations except INH & PAS, which proved to be the best protocol.

2. Toxic signs and symptoms were no more frequent than in the other protocols.

3. In certain instances where oral medication is not feasible, or when symptoms necessitate discontinuance, also, we have found that in certain instances the claim is made that the medication has been taken orally; whereas upon close checking there was no medication dispensed or taken, the injectable combination offers a definite advantage.

4. Other than INH and PAS, which proved the best protocol, there was little to differentiate the other seven protocols.

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THE USE AND MISUSE OF NEEDLE BIOPSY IN THE DIAGNOSIS OF MALIGNANT DISEASE *

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Needle biopsy has long been advocated as a valuable aid in the diagnosis of malignant disease. It also has been condemned as a dangerous and harmful procedure. At present, needle biopsy is gaining widespread use and it is our purpose to call attention to sites where this technique is suitable and safe, and to point out where the method is unsatisfactory based on reports in the literature and observations made on the Tulane Surgical Service at Charity Hospital.

Hannover,[13] the Danish pathologist was one of the first to use diagnostic surgical biopsies prior to the middle of the last century. Bouisson,[1] Professor of Surgery at Montpellier, biopsied ulcerating lesions for study in 1845. Histologic examination

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of curetted material from the uterus was advised by Kiwisch [16] in 1847. In 1851, Schuh [31] used the microscope in the study of certain surgical conditions.

The use of a needle to obtain tissue for diagnosis became popular almost as soon as any type of biopsy was performed. As in a number of procedures developed for medical use, needle biopsy probably was separately discovered and utilized by many more physicians than those who actually made formal reports on its use. Sedillot [1] at Paris in 1846, using needle puncture in the exploration of tumors with an instrument similar to a grooved director, obtained bits of tissue for microscopic examination. Kuss,[1] at Strasburg in 1846, devised a cannula with a harpoon-like stylet to capture tiny pieces of tumor for study. Bouisson,[1] in 1852, reported on the use of needle biopsy for diagnosis in malignant disease. Wintrich,[42] also in 1852, reported on this type of procedure for the diagnosis of breast lesions.

The first American report occurred in the *Transactions of the American Surgical Association*, in 1889, when J. Collins Warren [41] of Boston reported a cannula-like punch biopsy needle for use in the early diagnosis of cancer. The needle was designed by Dr. S. J. Mixter and had been used in over 100 cases at the time of the report.

Dr. Nicholas Senn,[33] Professor of Surgery at Rush Medical College, in his book *The Pathology and Treatment of Tumors*, published in 1895, described the use of aspiration biopsy. Dr. Senn called attention to the fact that "only specimens which represented both cells and stroma in their proper relations" enabled the microscopist to interpret the character of the tumor. Dr. Senn also pointed out that other workers, Bruns and Middledorpf in addition to those mentioned above, had devised trocars for the purpose of removing particles of tumor tissue for microscopic examination. Ward,[39] in 1914, used needle biopsy to study cellular material obtained from lymph nodes in patients with lymphoblastoma. In 1921, Guthrie [11] employed needle biopsy in the study of Hodgkin's disease.

Modern use, however, dates from 1930 when Martin and Ellis[18, 19] reported on a simple method of needle biopsy from Memorial Hospital at New York City. Subsequent reports on needle biopsy have pointed out extensive utilization of the procedure and have indicated its merits and the dangers encountered.

TECHNIQUE

The needle that we find most satisfactory for general use is the Vim-Silverman biopsy needle. (Fig. 1) This needle comes in lengths of 6 centimeters and 8.5 centimeters, the outer sheath is 14 gauge, and the inner stylet is 17 gauge. We prefer to use the shorter needle where possible, but with deep-seated tumors, the longer needle is necessary. The technique used consists of raising a small bleb in the skin overlying the tumor with 1 per cent procaine. The underlying tissue between the skin and the neoplasm is similarly infiltrated with care being taken to avoid injecting the tumor. Actually, very little pain is encountered in obtaining the biopsy specimen. A stab wound large enough to admit the needle is made with a bistoury knife (No. 11 Bard-Parker blade) through the skin bleb. The needle with its stylet in place is introduced and advanced to the edge of the tumor. The stylet is removed and the split blade obturator is inserted through the cannula into the mass for a distance of 1 to 2 centimeters. The cannula is advanced over the obturator with a rotary movement until the obturator is enclosed. The cannula and obturator are then both rotated 180 degrees in unison and withdrawn together. A core of tumor is generally found between the blades sufficient to make a satisfactory microscopic diagnosis. Occasionally, a second attempt will have to be made to obtain the required tissue.

The technique recommended by Martin[18] is even more simple and consists of using a sharp 18 gauge needle which is attached to a tightly fitting syringe. Using a similar technique to that mentioned above, the needle is advanced to the tumor, and then with the piston of the syringe partially withdrawn to produce a vacuum, the nee-

dle is introduced into the neoplasm and advanced and withdrawn several times. The material obtained in the needle is expressed onto a slide and smeared and fixed. Should any larger fragments be present, these are saved for paraffin sections. A quick staining method is used on the smeared material obtained from the

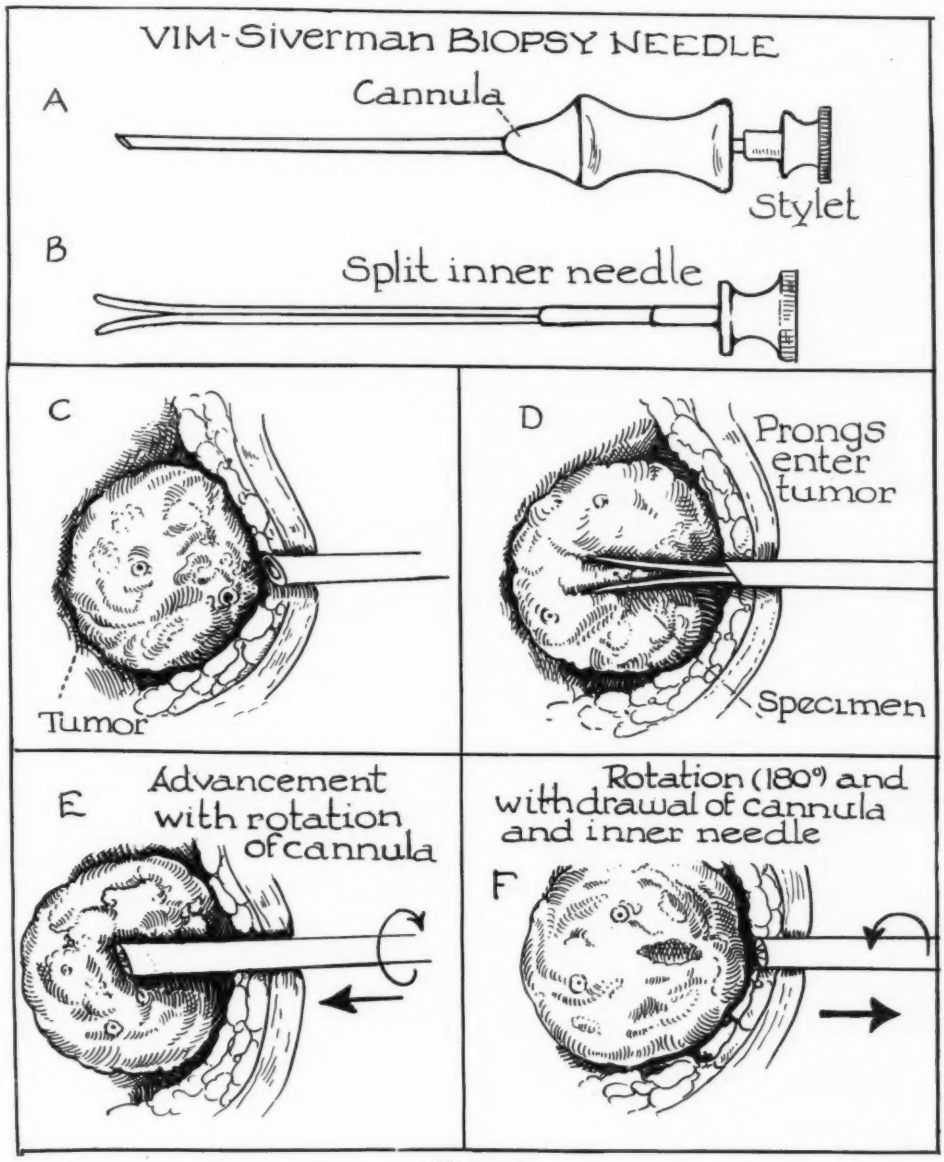

Figure 1

A. Vim-Silverman biopsy needle with stylet.
B. Split bladed inner needle.
C. The cannula with stylet in place is advanced to the tumor.
D. The stylet is replaced with the inner needle which is inserted into the mass.
E. The cannula is advanced over the inner needle.
F. Needle and cannula are rotated 180° and withdrawn with the specimen.

tumor, and the diagnosis may be made on the appearance of the cells. We generally find it more satisfactory to obtain a fragment of tissue for paraffin section and routine hematoxin and eosin stain. It is extremely important to have sufficient specimen to demonstrate the relation of the malignant cells to their stroma, and while an impression made on cytological study is highly suggestive, it should not be accepted as the final diagnosis.

A third technique utilizes the Turkel[36] needle which consists of an outer 12 gauge needle with a 14 gauge spear-pointed stylet. This needle with the stylet in place is introduced through the skin and soft tissues until the tumor is approximated. The stylet is removed and an inner needle is inserted which consists of a hollow obturator with a serrated edge that cuts tissue when turned in a clockwise direction. When the cutting obturator is in contact with the tumor, it is advanced with a clockwise rotation until the desired amount of tissue is obtained. A syringe is then attached to the obturator; gentle suction is produced, and the needle is removed with the specimen held in the obturator. This needle, originally designed for sternal punctures, has received considerable attention and modifications are now available for use in biopsying bone, liver, prostate, breast, and soft tissue masses.[30, 36] (Figure 2)

There is a fourth type of needle described by Semple[32] which utilizes the tissue-holding action of a harpoon with the cutting action of a trephine. The trephine is introduced with a pointed stylet in place. This is then advanced to the tumor; the stylet is removed, and a harpoon-like needle is passed down the trephine into the mass. The harpoon is then withdrawn slightly. This compresses the tissue on the edge of the trephine which by a rotary cutting action frees a fragment of tumor which is withdrawn with the entire instrument. (Figure 3)

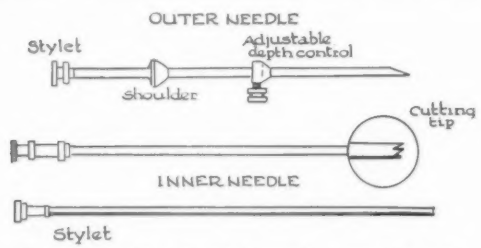

Figure 2—The Turkel needle consists of an outer needle with a cutting stylet (partially inserted as depicted above) and an inner needle with a serrated cutting tip. The latter has a stylet to protect teeth and push specimen out of the needle. (Modified after — Trephine Instruments, Inc. Catalog)

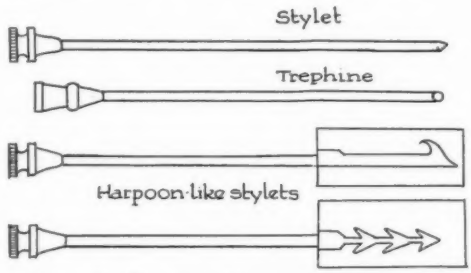

Figure 3—Harpoon biopsy needle consists of trephine with the pointed stylet which is advanced to the tumor. The cutting stylet is replaced with a harpoon-like stylet and this is inserted into the tumor. The harpoon is withdrawn slightly compressing the tissue against the trephine which by a rotary cutting action frees the specimen. (Modified after J. E. Semple, M. D., British Med J., June, 1951).[32]

Occasionally on attempting to aspirate a tumor one will find a cyst filled with fluid or an abscess with purulent material. The cyst fluid should be removed for cell block studies and pus obtained should be held for culture or other diagnostic studies that are indicated.

There are a number of limitations which apply to needle biopsy that apply to all types of biopsies. One problem consists of obtaining an adequate and representative specimen, and even with an open biopsy it is sometimes difficult to obtain the portion of tissue that will give the correct diagnosis. The needle biopsy is particullarly subject to failures from this point of view and may be on the basis of technical or operative difficulties. The removal of a portion of the tumor which contains none of the diagnostic cells is, of course, of no aid and may be misleading in providing false information.

Another difficulty with needle biopsy is that the tumor must be controlled or immobilized with one's hand as the needle is being introduced. Depending on the consistency of the tumor and the sharpness of the needle, this requires more or less manipulation of the neoplasm, which is to be avoided or kept at a minimum, as will be indicated subsequently.

Some of the other dangers that follow needle biopsy consist of: (1) infections occurring in the wound, (2) hemorrhage from friable vessels encountered in the tumor, and (3) injury to vital organs, nerves or blood vessels closely associated with the neoplasm. Careful technique, skill, and judgement will limit the extent of these complications.

Another difficulty to be feared is ulceration of the skin over the tumor allowing a fungating mass to appear, particularly if the underlying tumor is under any pressure. This danger is more prevalent with incisional biopsy than with needle biopsy and in some instances needle biopsy may be elected in an attempt to prevent fungation.

The most feared complication from biopsy is the dissemination of tumor cells following the diagnostic procedure. As a result of trauma, a malignant tumor may extend locally, to regional lymph nodes, or by blood-borne metastases. A great deal of work has been done along these lines and it is appropriate to review the pertinent material.

Any type of incision into a malignant tumor has always been condemned by some members of the medical profession. In the past, Bloodgood, Sir Watson Cheney, and Czerny [8] all went on record as being strongly opposed to biopsy. On the other hand, Ewing [8] believed that the information from biopsy was usually decisive and essential, and he stated that he had never seen any untoward results, whereas in cases of failure to biopsy he had seen many hopeless situations arise.

In 1913, Tyzzer [37] working with experimental tumors in mice concluded that the incomplete removal of cancer did not increase metastases, but did accelerate the growth of metastatic lesions. He also showed that massage of a malignant tumor did cause an increase in distant spread. It was later pointed out that Japanese waltzing mouse carcinoma employed by him did not always metastasize.

In 1919, Wood,[43] using the Flexner-Jobbling carcinoma in 673 rats, concluded that probitory incision did not increase metastases. In 1946, Maun and Dunning,[20] realizing that many clinicians were prone to avoid incisional removal of tumor for biopsy, because of the fear of disseminating malignant cells and believing that experimental evidence and medical opinion were not in accord, decided to investigate the problem using more biologically uniform material. They concluded from their work with rats and four different tumors that biopsy did not affect the survival period or the per cent of metastases, but that removal of a primary tumor decreased metastases and increased the survival rate.

Patterson and Nuthall,[26] in 1939, published an article evaluating the risk of incisional biopsy in ulcerating squamous carcinoma. This was a superficial biopsy with a minimal amount of manipulation. Two groups of well-selected cases of squamous carcinoma of the buccal cavity were employed and it was noted that 20.5 per cent of the cases not biopsied developed metastases, whereas 19 per cent of the cases biopsied developed metastases. This was a clinical study involving 166 cases and the authors concluded that biopsy of ulcerating squamous carcinoma did not increase metastases. In 1946, a report from the Central Institute of Radiotherapy [22] in Helsinki based on 8,000 cases stated that biopsy did not stimulate growth or increase metastases if taken prior to or during radiological therapy. In 1947, Ochsner, DeBakey and Dixon [23] condemned needle biopsy for possible cancer of the lung, because of several cases in which seeding had occurred along the path of the needle; they did not mention distant metastases. Ellis,[9] in 1947, stated that needle biopsy caused less disturbance and was therefore less dangerous

than other methods of study for non-ulcerating lesions, and he believed that his procedure was extremely practical for otherwise inaccessible tumors. Dukes,[7] in 1949, stated that any type of injury or rough manipulation may accelerate the growth of a tumor and cited work done on a large group of patients in the Strangeways Laboratory at Cambridge in which the taking of biopsies had no adverse effect on the survival rate of patients with uterine or cervical carcinoma. In a consideration of needle biopsy, Rosemond, Burnett, and Hall,[29] in 1949, followed 67 patients for five months to four years after operation and biopsy from lung lesions, and decided that the spread of tumor cells along the needle track had been overemphasized. In doing so, they mentioned that the majority of patients had died of distant metastases. In discussion of this article, Wood objected to aspiration biopsy on the basis that tumor seeding along the needle track does occur and that vascular metastases increase. In 1951, Crile and Vickery[6] reported an example of seeding along the needle track in a patient with thyroid carcinoma. In 1954, Robbins et al[28] at the Memorial Hospital concluded on the basis of a statistical study that aspiration biopsy of breast cancer had no deleterious effects on long-term survival rates among their patients.

In the Department of Surgery at Tulane University School of Medicine, it was found that no statistically significant difference could be demonstrated between the biopsy and control groups in a study conducted on the effect of needle biopsy on the spread of metastases using the Brown-Pearce and the V-2 tumors in rabbits.[17] It was also noted in several experimental animals that seeding along the needle track did occur and therefore the track should be excised or included in the plan of therapy.

It is obvious from the above review that the problem has not been finally resolved as to the safety or danger in the use of needle biopsy. There are particular situations, however, in which needle biopsy is effective and in the following paragraphs we will discuss them by site.

SITES

Neck. Tumors that occur in the neck frequently offer problems in differential diagnosis that require biopsy to solve, and the lesions are relatively superficial and easily approached. This is particularly true in metastatic lesions involving cervical lymph nodes where the primary is not obvious. It must be emphasized that a careful search for a primary lesion in the nasopharynx, oropharynx, and larynx should be carried out and that as a rule biopsy of a primary carcinoma, if discernible, should always be attempted before the secondary lesion. The routine studies whereby the diagnosis of a specific infection or granuloma can be established prior to biopsy should not be overlooked. In the case where the tumor consists of a carcinomatous cervical node, a needle biopsy here instead of an incisional biopsy will make subsequent surgery easier if a radical neck dissection has to be performed. In a patient with a lymphoma involving cervical or other lymph nodes, we prefer to utilize excisional biopsy as the pathologist usually needs the entire lymph node intact so that the architecture of the gland as well as the cells present may be studied in order to establish the diagnosis.

The diagnosis of tuberculous lymphadenitis may be made on the clinical findings, but if the diagnosis is not obvious, aspiration biopsy is desirable as there is less chance for ulceration and establishment of draining sinus tracts.

The use of needle biopsy in thyroid lesions is more debatable. Several investigators have recommended its use, particularly in diagnosing thyroiditis and its variations.[5, 6, 12] We favor surgical exposure in the diagnosis of thyroid masses. In several instances when we have elected to do needle biopsy for thyroid lesions, the patients have had difficulty due to hemorrhage in the thyroid gland or the neck. One such patient was an elderly woman with a thyroid mass in which we wished to rule out malignant disease. The patient refused operation and

needle biopsy was attempted. Tissue was obtained suggesting a nodular goiter; however, the hematoma that ensued required the patient to be kept under close supervision for several days, and left a residual mass that obscured accurate observation of the thyroid for a period of several months. With another patient in whom we wished to establish the diagnosis in suspected thyroiditis, we failed to obtain a specimen due to the fibrosis of the gland and again were troubled with a hematoma which required careful observation.

Soft tissue tumors of the neck or other peripheral sites, in which a microscopic diagnosis aids the planning of definitive treatment, are also suitable for the use of needle biopsy.

Breast. The breast is a very satisfactory site for the use of a needle biopsy. Radical mastectomy if the tumor is malignant also permits the removal of the needle track which we believe should be performed following the biopsy of a malignant lesion. We have also found it expedient to use needle biopsy in some lesions which may be benign and if confirmed, the tumor can be excised on an outpatient basis. We also find that having a positive needle biopsy in cancer cases saves considerable anesthesia time in the operating room as the frozen section, reprepping and draping can be avoided. It also provides for a better surgical field as a recent incisional biopsy wound with its dangers of spillage of tumor cells can be avoided. The negative needle biopsy in the breast as in any other area is meaningless and should we obtain a negative biopsy we then resort to conventional biopsy and frozen section.

There have been a few instances in which attempted needle biopsy in breast lesions has met with failure due to the dense fibrosis of the tissue to be biopsied. This type of disease generally is seen with chronic cystic mastitis in which there is marked fibrous involution; however, use of the Turkel needle should obviate this situation.

Lung. Our feeling is that the needle biopsy has little or no place in the management of lung lesions. Several patients with seeding along the needle track following biopsy have been noted in this clinic as has been reported above.[23] The author has observed another patient at the New Haven Hospital with a clinical diagnosis of carcinomatous seeding along the needle track following biopsy of a lung cancer. Should needle biopsy be essential in establishing a microscopic diagnosis prior to x-ray or nitrogen mustard therapy, the x-ray field should be designed to include the needle track.

Liver. The use of needle biopsy in diagnosis of liver lesions has become well-established.[2, 10, 21, 40, 44] Certain hazards exist in this situation and there is a definite mortality which was only 0.085 per cent in the series of 20,016 needle biopsies of the liver reviewed by Zamcheck and Klausenstock.[44] In a recent paper by Morey et al[21] the mortality was 0.72 per cent. A number of other patients will have complications due to bleeding, pain, or bile peritonitis. The incidence of successful diagnosis with needle biopsy for metastatic or primary lesions of the liver varies considerably. In a series reported by Finley and Brownson,[10] liver biopsy revealed neoplasm in 19 of 25 cases in which there was clinical suspicion of cancer. Ward et al[40] were able to demonstrate 82 positive diagnoses in 111 patients with proven primary or secondary hepatic neoplasms. Bowden and Kravitz[2] found neoplastic disease in 42 of 76 patients with suspected hepatic metastases. Sixteen of the remainder were later shown to be free of liver involvement and in 18 cases the biopsy was falsely negative. The success reported in establishing malignant disease with liver biopsy is rather remarkable in view of the large areas of liver which are grossly uninvolved as is frequently demonstrated at laparotomy or autopsy. In situations where laparotomy can be avoided by needle biopsy, the procedure would seem to be indicated.

Abdomen. As to needle biopsy of other abdominal organs, the danger of perforation of the bowel is such that the procedure is not warranted unless it is done at

time of laparotomy. In this regard, the operator may find a Silverman needle helpful in biopsying pancreatic or liver lesions.[6] On the other hand, diagnostic paracentesis with a Potter needle is frequently useful in the management of acute abdominal conditions, as reported by Thompson and Brown[35] at Charity Hospital, and should not be overlooked.

Kidney. Several workers have advocated the use of needle biopsy in diagnosis of renal diseases and the mortality seems relatively low.[3, 14, 25] In a series reported by Parrish and Howe,[25] out of 600 collected cases, there were two deaths, a mortality of 0.3 per cent. In this same paper, renal biopsy established a definitive diagnosis in 91 per cent of the patients, confirming the clinical diagnosis in only 39 per cent of the cases. These consisted of almost entirely nonmaligant conditions. In 9 per cent neither the pathologist nor the clinician could arrive at a definitive diagnosis. In general, the usefulness of needle biopsy in primary renal malignancy has not been demonstrated and also, the danger of rupturing the renal capsule in the patient with carcinoma of the kidney would further tend to condemn the procedure.

Bone. Needle biopsy of metastatic or primary lesions in bone in relatively inaccessible areas such as the bodies of the vertebrae makes this technique useful.[24, 25, 38] The Turkel needle is particularly designed for trephining of bone and has been found satisfactory in the more accessible lesions of bone as well.

Prostate. Needle biopsy has proven to be effective in the diagnosis of prostatic malignancy.[4, 15, 27, 30, 32] Kaufman, Rosenthal and Goodwin[15] reported a high degree of correlation between digital-rectal evaluation and open surgical biopsy (74 per cent), and needle biopsy (73 per cent). Prostatic smear in this same series of 110 cases showed correlation of 45 per cent when compared to the results of surgical biopsy. In the advanced lesions which could only be treated by endocrine therapy there was a high degree of correlation while in the remaining less advanced cases the correlation was lower. In these latter cases, the therapy of choice would be radical prostatectomy and presumably the patient would have a somewhat better chance of successful control if needle biopsy was not performed, due to the danger of local implantation of carcinoma. An article by Clark et al,[4] in 1953, reported a case of implantation of prostatic carcinoma in the site of perineal needle biopsy. In the more advanced lesions it would certainly seem to be an indicated procedure, especially when one reviews the figures from various tumor registries as prostatic cancer is a malignant lesion commonly treated on the basis of clinical impression rather than tissue examination. In the Tumor Registry of Charity Hospital in 391 cases of prostatic carcinoma in a three year period, 1948-50, we found that 24 per cent of the cases were treated on the basis of clinical impression alone. In Kaufman et al[15] series of 110 cases, the bladder was perforated 10 times and the rectum 4 times without untoward sequelae.

CONCLUSIONS

Needle biopsy is a technique that is useful as an aid in the diagnosis of malignant lesions. The danger of the dissemination of distant metastases following the use of needle biopsy apparently is slight if manipulation and trauma are kept at a minimum. Spread along the needle track may occur, therefore in those cases where the potential seeding of the track can be controlled by excision, radiation, or systemic therapy, the procedure may be elected. In those instances where seeding will not affect the patient more adversely than his disease, it may be used to establish a tissue diagnosis.

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NEW DRUGS—WHEN SHOULD WE USE THEM?

RICHARD B. LANGFORD, M. D.
SHREVEPORT

Each year several thousand new drug products are placed on the market. This includes new dosage forms of old drugs, new drug combinations, and drugs which have not previously been available in any form.

Unfortunately, many of these have been inadequately tested before being placed on the market. This is brought out from time to time in the medical literature in reports of previously unreported toxic reactions. Occasionally, toxic effects become apparent only after prolonged use. Therapeutic benefits resulting from the use of many new drugs frequently do not seem so wonderful after several months use as they did at first. This may be due to loss of enthusiasm on the part of the physician

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prescribing the drug or on the part of the patient.

The information we receive concerning these new drugs comes from several sources. Most are reported first in experimental journals but these are read primarily by research workers and full time medical school teachers. Several months (sometimes several years) later the clinical journals intended for practicing physicians may have adequate reports on the new preparations. Ordinarily, the drug will be released for our use before or very soon after the reports in clinical journals. In order that we may be informed about these new drugs, the manufacturer or distributor sends literature to us in the form of advertisements in medical journals and in colorful folders which seem to arrive by the bushel in our office mail. We may even receive bright sample packages. Shortly after this, a representative (or drug detail man) calls at our office to tell us in person about the new preparation. The individual is usually impressed with the superiority of his company's product over that of its competitors. His judgment in the matter is colored by the fact that his company emphasizes to him the beneficial effects and minimizes the side effects and toxic effects in order not to dampen his enthusiasm in advertising the product. In turn, his income frequently is dependent directly or indirectly upon the volume of sales of his company's products in the area in which he works.

During the period of development of a new drug, one of our popular magazines is very likely to gather together a few fragments of information and publish a report for our patients to read. Many patients take any such magazine article to mean that the new drug is just the thing they have been needing and consequently we are approached from another direction with a request that we prescribe the new drug.

Most present day physicians are familiar with the events which transpired when Demerol (meperidine hydrochloride) was first placed on the market. At that time it was thought to be an effective drug in producing pain relief and at the same time it was felt that it would not produce addiction. Subsequently it was found that addiction was easier to produce with Demerol than with morphine.

Several years ago folic acid was brought out as an effective oral treatment for pernicious anemia. It will correct the anemia of pernicious anemia but will not prevent (and may even help produce) the development of the serious central nervous system damage which usually accompanies the untreated disease.

Phenylbutazone (Butazolodin) which is effective against arthritis, was found to produce bone marrow damage in a high percentage of cases. There have been several other drugs in this category.

Benzchlorpropamide (Hibicon) was brought out several months ago and now has been taken off of the market. I am not sure about the reason for this but evidently there is some question regarding its ability to produce toxic effects after long term use.

More recently, chlorpromazine hydrochloride (Thorazine) and meprobamate (Equanil and Miltown) have been introduced as drugs to relax all of our nervous patients. Thorazine has been shown to produce jaundice quite frequently and to produce agranulocytosis on certain occasions. Equanil has not been available for many months but untoward reactions are coming to light.[1]

Many more examples of reactions or inadequacy of new drugs could be cited. For a slightly different approach to the same subject one might profit by reading the excellent article by David P. Barr.[2]

What does this mean to the practitioner? The most important point is that each of us should make a point of finding what the various drugs will and will not do before prescribing them. We should consider the hazards of the drug we plan to use and should attempt to decide in our own mind if the beneficial effects expected warrant exposing the patient to the hazards. Many diseases are self-limited, and in such cases we must make every attempt to see to it that our therapy does not

actually increase the burden of recovery. We should limit the number of drugs given to an individual patient to those which we feel certain that he needs. The more drugs we give to each patient, the more risk we run of producing a toxic or an allergic reaction. The physician must accept the fact that untoward reactions will occur from time to time, even when meticulous care is used. We should attempt to keep the number of such reactions at a minimum. Our judgment should be much better than that of our patients regarding their need for treatment, so accordingly, the decision to use a certain drug should be based on our judgment rather than the patients' request.

In answer to the title of this paper "New Drugs — When Should We Use Them"? it is simple enough to say: (1) When we know what the action of the drug is, (2) when we know that it is relatively safe and (3) when we feel that it is the best drug for the individual we are treating.

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TREATMENT OF EPILEPTIC SEIZURES

In a recent report of the Council on Pharmacy and Chemistry by Yahr and Merritt,* some of the broad aspects of the problem and the current status of the drug therapy of epileptic seizures are presented. This report clarifies and summarizes much that will be helpful to the physician in treating the individual who has epileptic seizures. It points out that since convulsive seizures may precede other symptoms of disorders of the nervous system by many years constant re-evaluations are necessary.

Considerable progress has been made in the past two decades in both diagnosis and treatment of epilepsy. Epilepsy is a symptom-complex characterized by periodic transient episodes of alteration in the state of consciousness, which may be associated with convulsive movements, and/or disturbances in feeling or behavior. The authors point out that before beginning treatment it is important to define properly the type of seizure and detect, if possible, the underlying disease process, as there are many conditions and diseases of the nervous system in which convulsive phenomena are prominent. The combined techniques of electroencephalography, pneumoencephalography, and angiography have made it possible to verify specific seizure types and to uncover pathological processes previously not diagnosed except at operation or autopsy.

When a structural defect or physiological disturbance of the brain can be demonstrated the convulsive disorder is described as symptomatic of such condition. When adequate inquiry reveals no organic background for the seizures there remains, as we all know, a large group of cases who have seizures called epilepsy. Clinical manifestations that occur during this seizure are related to the site of origin of the abnormal discharge that initiates the seizure and to the rapidity and extent of the spread of the discharge. Classification is made on this basis and not on the pathological process responsible for the attacks. The attacks are grouped as grand mal, focal, psychomotor, and petit mal.

Grand mal seizures occur with or without aura and are characterized by sudden loss of consciousness folowed by generalized tonic and clonic spasms of the musculature.

Focal seizures have some clinical manifestation that indicates their site of origin as in the cerebrum. A classical example of

* Yahr, M. D. and Merritt, H. H.: Current status of the drug therapy of epileptic seizures, J.A.M.A. 161:333, (May 26) 1956.

focal attack is the so-called Jacksonian seizure.

Psychomotor attacks are characterized by automatic pattern movements with clouding of consciousness and postictal amnesia for the episode, which may extend over two or three minutes.

The typical petit mal attack is characterized by sudden brief lapse in consciousness with minor motor movements of the head, eyes, or extremities. The duration is five to thirty seconds.

The objective of the anticonvulsant therapy is to establish and maintain a reservoir of drugs sufficient to control the seizures while producing a minimum of side reactions. The drugs currently employed are:

Barbituric Acid Derivatives. — Phenobarbital, mephobarbital, metharbital and primidone.

Hydantoin Derivatives. — Diphenylhydantoin sodium (Dilantin) and methylphenylethylhydantoin (3-methyl-5, 5-phenylethylhydantoin). (Mesantoin)

Oxazolidine Derivatives.—Trimethadione (Tridione) and paramethadione. (Paradione)

Phenylacetylurea Derivative.—Phenacemide. (Phenurone)

Succinimide Derivative.—Phensuximide.

Carbonic Anhydrase Inhibitor. — Acetazolamide.

It is pointed out that the anticonvulsants have no fixed dosage and the dose to be employed is the amount necessary to control seizures unless toxic reactions make necessary reduction of the dose or withdrawal. When toxic reactions occur it is advised that the dose be reduced and another drug added as it is frequently found that the combination of drugs is more effective than a single drug. This is true if more than one type of seizure exists. Diligence and patience are necessary to find by this method of trial and error the best possible combination of drugs and the optimal dosage schedule for each individual patient. The initial drug of choice for all types of seizures except petit mal are diphenylhydantoin sodium and/or phenobarbital. When the drowsiness and lethargy of phenobarbital effect does not disappear with the continued use of the drug, these symptoms may be relieved by the use of amphetamine sulphate in doses of 5 to 20 mg. daily. The toxic effect uniquely seen with diphenylhydantoin sodium is hypertrophy of the gums and this requires special attention to the gums with the emphasis on good dental hygiene. Methylphenylethylhydantoin (Mesantoin) has drowsiness as a frequent side effect and also allergic skin eruptions. A more serious toxic effect is degeneration of the bone marrow which may occur during its administration. Patients taking this drug should have a complete blood cell count once a month throughout the period of treatment.

Mephobarbital and metharbital have an effect similar to phenobarbital and less sedative action. Primidone because of undesirable side effects is seldom given in full therapeutic dose; when used it is best combined with other drugs, usually diphenylhydantoin sodium.

The use of bromides entails frequent determination of serum bromide levels. Their administration now is chiefly for patients in whom all other drugs have failed.

Phenacemide is of infrequent use because of its toxic effects.

Acetazolamide (Diamox) is a type of agent recently employed in the treatment of epileptic seizures. The drug has acidifying and dehydrating properties. To which of these properties anticonvulsant action can be attributed is unknown. The toxic effects of long continued usage may be serious in some patients.

The treatment of petit mal requires special considerations whether it exists alone or in connection with the other three types of seizures. Particular drugs for its control are necessary and these are not effective against the other types of seizures. The drugs to be used for petit mal are trimethadione, paramethadione, and phensuximide, in that order. Any of the three may have some undesirable side reactions. Possibly combination of the first two may give better effect than either one alone. Toxic reactions may be aplastic anemia,

agranulocytosis and nephroses.

The status epilepticus exists when seizures occur with such frequency that recovery from effects of one attack does not occur before the next attack supervenes.

This condition is a medical emergency best handled in the hospital. Adequate support is essential with attention to the need for fluids, electrolyte balance, possible dehydration, and support of nutrition. The drugs recommended are phenobarbital sodium, amobarbital sodium, and paraldehyde.

Yahr and Merrit list the causes for failure and emphasize that good results are dependent upon thorough evaluation of the neurological status, critical classification of the type of seizure, and painstaking establishment of adequate drug therapy. They consider that seizures can be completely controlled in 50 per cent of the patients and greatly reduced in another 35 per cent. Some of the faults to be avoided are improper classification of the seizure type, failure to recognize the progressive neurological disease, failure to use proper drugs, to administer proper dosage, and the frequent shifting of drugs. They consider that two to three years' treatment should continue after the last seizure, and when medication is discontinued it must be done gradually over a period of a year or so. They urge the proper indoctrination of patients as to the aims and methods. They urge that the patient be made to feel that with the control of his seizures the opportunity for assuming his rightful place in society exists. The article is a clear and compact summary that the physician will find a valuable help in the care of the epileptic or the one who seems to be an epileptic.

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ORGANIZATION SECTION

The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

THE SEARS-ROEBUCK FOUNDATION

A year ago the Sears-Roebuck Foundation, in cooperation with the American Medical Association, made a grant of $125,000 for the establishment of a Revolving Assistance Fund. The purpose of this fund was to make loans to physicians desiring to establish or improve medical facilities in areas where the medical care is inadequate. It is the intention of the Foundation to continue to make this grant to the Revolving Fund each year. Evaluation of all applications is done by a Medical Advisory Board composed of prominent and highly qualified physicians appointed by the Trustees of the American Medical Association.

In the short time the fund has been in existence, 22 loans have been made affecting 33 physicians from 13 states. Loans ranged from $3,000 to $25,000, and total loans amounted to $179,500. Loans have gone to general practitioners, specialists, partnerships and medical groups. The sole criteria, besides medical proficiency, have been the need of the community for medical care. So that the Revolving Fund may grow, all repayments, principal and interest, go into the fund for future loans. There is no charge to this fund for administration of the program. This is met by another Foundation grant.

In 1956 it was necessary to have two cut-off dates in processing applications—April 1 and October 1. Applications received before April are decided upon before June 15. Applications received before October 1, shall be acted upon by December 15. The Foundation is now accepting applications for the last half of 1956.

This is a great opportunity offered physicians and communities to provide a real service to people in respective sections of our state not now having adequate medical coverage or medical facilities. This is a 10-year, non-secured loan ranging from zero to six per cent interest depending on the rapidity of repayment.

Undoubtedly, there are many physicians in our state who are not aware of this opportunity to improve existing facilities or to establish themselves in private practice in rural or suburban areas. The April 1 cut-off date is ideal for graduating interns since loans are approved in June which is generally the time they graduate. The October cut-off date is ideal to aid those established physicians who have poor medical facilities and are now in a position to incur the responsibility of building or improving their medical units.

This revolving assistance fund has great potential. It is now growing very rapidly. The future of this fund, to be of the greatest service to the medical profession in the field of medical distribution, depends entirely upon how well physicians and communities become informed of the existence of such wonderful advantages and opportunities offered by the existence of this fund.

Physicians who are completing their internship and residencies have a golden opportunity to locate in desirable communities by obtaining financial assistance through this fund.

We sincerely hope many of our physicians will avail themselves of the offer by this foundation, thereby relieving themselves of financial troubles in getting happily located to practice their chosen profession.

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MEDICAL NEWS SECTION

CALENDAR

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
Calcasieu	Fourth Tuesday every other month	Lake Charles
East Baton Rouge	Second Tuesday of every month	Baton Rouge
Morehouse	Third Thursday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Tangipahoa	Second and fourth Thursdays of every month	Independence
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

NEWS ITEMS

Dr. Irwin M. Marcus addressed the Louisiana Chapter of the American Association of Psychiatric Social Workers on "Levels of Group Psychotherapy" on June 28th at L.S.U. Medical School.

The Louisiana Group Psychotherapy Society was recently accepted as an affiliate organization by the American Group Psychotherapy Association. The officers elected are: Dr. Irwin M. Marcus, President; Dr. Robert Lancaster, President-elect; Dr. Irvin Kraft, Treasurer; Dr. Morton Enelow, Corresponding Secretary; Mr. Knox Price, Secretary.

The New Orleans Psychoanalytic Society, a member of the American Psychoanalytic Association, elected as its new officers Dr. Henry Miles, President; Dr. Theodore Watters, President-elect; Dr. Irwin M. Marcus, Secretary-Treasurer.

FURTHER DRUG EXPERIMENTS MAY EXPLAIN EPILEPSY

A new drug, which almost completely controlled epileptic seizures in 34 of 126 patients, eventually may help explain the physiological basis of the seizures, three Boston physicians said recently.

The drug acetazolamide (Diamox) caused a 90 to 99 per cent reduction in seizures in 12 other patients, a 50 to 90 per cent reduction in 22, and a smaller reduction in the remaining 58, the doctors said in the Jan 28 Journal of the American Medical Association.

Epilepsy is characterized by sudden disturbances of brain function, resulting in temporary loss of consciousness. The attacks range from minor to major ones. It may have a hereditary basis or have other causes, including brain injury, a disease in another organ which acts on the brain, emotional disturbances, and alcoholism.

In the past it has been found that changes in the amount of carbon dioxide in the blood, which affect the body's acidity, influence the course of epilepsy. An increase in acidity has been helpful for young persons and certain other types of epileptics. This acidosis has been achieved by diets, inhalation of carbon dioxide, and other methods, but all of them have been limited in use.

RECOVERY FROM PULMONARY EMBOLISM FOLLOWS PROLONGED LEVOPHED USE

Large doses of Levophed (nor-epinephrine), administered by intravenous drip continuously over a period of 11 days, were responsible for the recovery of a patient with massive pulmonary embolism, according to Dr. J. de Swiet of Llanelly Hospital, England.

He states in the **British Medical Journal** (2:

1252, 1955) that medical literature reports only one previous instance of Levophed's use to treat this "common and often fatal emergency." It remains the "most sinister" of post-operative complications. The value of Levophed, the author comments, is known to many doctors, but "deserves to be widely appreciated."

Massive pulmonary embolism was diagnosed in a 49-year-old male patient following a partial gastrectomy, precipitating severe hypotensive shock. An intravenous infusion of Levophed was started in an initial strength of four mg. in a liter of saline solution at an average drip rate of 30 drops a minute. The concentration of the solution and the rate of infusion were varied according to blood pressure readings.

PAN-PACIFIC SURGICAL ASSOCIATION
Seventh Congress
Honolulu, Hawaii
November 14-22, 1957

The Seventh Congress of the Pan-Pacific Surgical Association will be held in Honolulu, Hawaii November 14-22, 1957. All members of the profession are cordially invited to attend and are urged to make arrangements as soon as possible if they wish to be assured of adequate facilities.

An outstanding scientific program by leading surgeons with sessions in all divisions of surgery and related fields promises to be of interest to all doctors.

Further information and brochures may be obtained by writing to Dr. F. J. Pinkerton, Director General of the Pan-Pacific Surgical Association, Room 230, Young Building, Honolulu, Hawaii.

COURSE IN POSTGRADUATE GASTROENTEROLOGY

The American College of Gastroenterology announces that its Annual Course in Postgraduate Gastroenterology will be given at The Roosevelt in New York City, on 18, 19, 20 October 1956.

The Course will again be under the direction and co-chairmanship of Dr. Owen H. Wangensteen, Professor of Surgery of the University of Minnesota Medical School, who will serve as surgical co-ordinator and Dr. I. Snapper, Director of Medical Education; Beth-El Hospital, Brooklyn, N. Y., who will serve as medical co-ordinator. Drs. Wagensteen and Snapper will be assisted by a distinguished faculty selected from the medical schools.

The subject matter to be covered in the course, from a medical as well as surgical viewpoint, will cover, essentially, the advances in diagnosis and treatment of gastrointestinal diseases and a comprehensive discussion of diseases of the mouth, esophagus, stomach, pancreas, spleen, liver and gallbladder, colon and rectum, with special studies of radiology and gastroscopy.

For further information and enrollment write to the American College of Gastroenterology, Department P.G., 33 West 60th Street, New York 23, N. Y.

CLEANER AIR MADE POSSIBLE BY NEW ELECTRONIC FILTER

The power of the electron, widely used in industrial smoke abatement and dust reclamation programs, has been harnessed this spring to help keep the home cleaner.

Now on the market are three RCA WHIRLPOOL room air conditioners with built-in electronic filters.

An electronic charge on the filter grabs particles from the air, as it circulates and recirculates through the air conditioner, and holds them fast. Air-borne matter one-tenth the size of particles which can be efficiently held by ordinary mechanical filters is stopped before it enters the home.

For the housewife, the electronic filter means a reduction of dust, soot, and pollens in the home. With less dirt, cleaning is easier and life and beauty of fabrics and painted surfaces are prolonged.

Cleaner air made possible by the new filter is easier to breathe—an important comfort factor in the pollen season.

WOMAN'S AUXILIARY TO THE LOUISIANA STATE MEDICAL SOCIETY

EXECUTIVE BOARD

The 1956-57 Executive Board and Executive Committee of the Woman's Auxiliary to the Louisiana State Medical Society is composed of the following members:

Officers

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Mrs. W. A. K. Seale, Sulphur

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Mrs. H. Whitney Boggs, Shreveport
Revisions of By-Laws:
Mrs. Edwin Socola, New Orleans
Romance and Research of Medicine:
Mrs. L. L. Sherman, Golden Meadow
Today's Health:
Mrs. Creighton Shute, Opelousas
Yearbook:
Mrs. Collins P. Lipscomb, Ponchatoula

Parish Presidents (Incomplete)

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BOOK REVIEWS

Angiographic Localization of Intracranial Masses; by Arthur Ecker, M. D., Ph. D. and Paul A. Riemenschneider, M. D., Springfield, Illinois, Charles C Thomas, 1955. pp. 433, 413 Illustrations. Price $13.50.

Radiologists and neurosurgeons will find in the first section of this atlas, useful diagrams of the angiographic patterns made by the more common brain tumors, and in the second section, good reproductions of angiograms from 100 cases illustrating the experiences of the authors at the new Upstate Medical Center of the State University of New York. This work is a substantial contribution to a subject which has received less attention in the United States than in Europe since the introduction of angiography, in 1927, by Egaz Moniz and Almeida Lima.

Carotid and vertebral angiograms are illustrated. The authors employed the open technique for the former and the indirect method (injecting the exposed right common carotid artery retrograde to the direction of flow, with the right brachial artery occluded) for the latter, and special attention was given to careful posturing of the head. Anterior-posterior and lateral projection were commonly used, and exposures were made in arterial and venous phases. Occipital and optic foramen views, as well as submento-vertex projection are also shown in a few cases.

The data is presented from the point of view of the location of an intracranial mass. Of the supratentorial lesions there were: 30 gliomas, 10 meningiomas, 19 hematomas, 7 infection processes, 4 pituitary adenomas, 2 each—pinealomas, craniopharyngiomas, metastatic carcinomas, and melanomas. There were also 5 brain stem lesions, including 3 hematomas, 1 glioblastoma, and 1 aneurysm. Finally, there were 11 posterior fossa lesions; notably, 3 hemangiomas, 3 medulloblastomas, 2 acoustic tumors, and 1 each—metastatic carcinoma, glomus jugularis tumor, and cerebellar abcess. Little effort is made to evaluate the relative merits of other diagnostic methods, although case histories are given for the reader to draw his own conclusions.

Displacements of vessels by supratentorial lesions are presented in the following detailed groups:

I. Perisellar—intra, pre, and supra.

II. Perisylvian—infra, inter, and supra.

III. Midline—1. callosal—anterior and posterior 2. parasagittal—frontal, fronto-parietal, and parietal.

IV. Frontal—lateral, medial (anterior callosal), polar, central, and basal.

V. Temporal—medial, infromedial, and posterior.

VI. Occipital.

These amplify the well established patterns given by Carl List and Almeida Lima and are made very clear by diagrams. Downward displacements of the anterior choroidal artery and increased kinking of distal portions of the larger vessels are particularly noted. The occurrence of edema and glial invasion of the brain may make precise interpretations of these displacements hazardous. Of course, the clinically probable tissue diagnosis may help x-ray interpretation.

Similar displacements of posterior fossa lesions include: 1. Depression of the posterior inferior cerebellar artery into the foramen magnum. 2. Upward displacement of the anterior choroidal artery. 3. Small curvilinear displacements of larger vessels.

Recent description of the anterior choroidal artery by Cooper in 100 cases presumed to be normal should be consulted for details not included in the author's discussion. Dural venography is not included, and the intrinsic circulation of tumors is likewise not presented. From a surgical point of view this is unfortunate, since one of the most helpful aspects of angiography is the demonstration of the vascular channels related to a tumor. Not only can the feeding artery or venous drainage be attacked with greater assurance when it is known, but the tissue diagnosis may be partially limited by the size and position of the vessels.

The data suggesting compression of the optic chiasm by the intracranial internal corotid and its branches is as yet fragmentary. The cases presented are suggestive, but require confirmation by other observers before this condition can be diagnosed with certainty.

W. RANDOLPH PAGE, M. D.

PUBLICATIONS RECEIVED

Budlong Press, Chicago: A Doctor's Marital Guide for Patients, by Bernard R. Greenblat, M. D.

Philosophical Library, N. Y.: Plastic Repair of Genito-Urinary Defects, by George Bankoff, M. D.

W. B. Saunders Co., Phila.: The Recovery Room, Immediate Postoperative Management, by Max S. Sadove, M. D., and James H. Cross, M. D., with contributions by 24 authorities; Treatment of Heart Disease, a Clinical Physiologic Approach, by Harry Gross, M. D., and Abraham Jezer, M. D.; Collected Papers of The Mayo Clinic and The Mayo Foundation, edited by Richard M. Hewitt (Vol. XLVII).